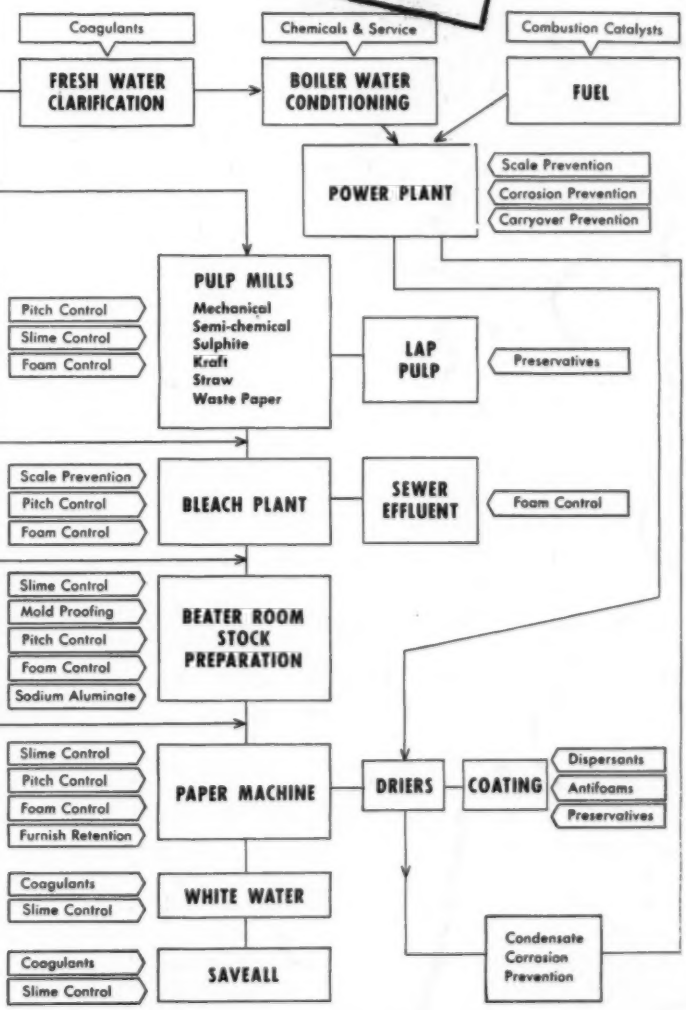
The

ECHNOLOGY DEPT.

NOV 20 1952
DETROIT

CHART of Nalco®

PRODUCTS and SERVICES for the PAPER INDUSTRY

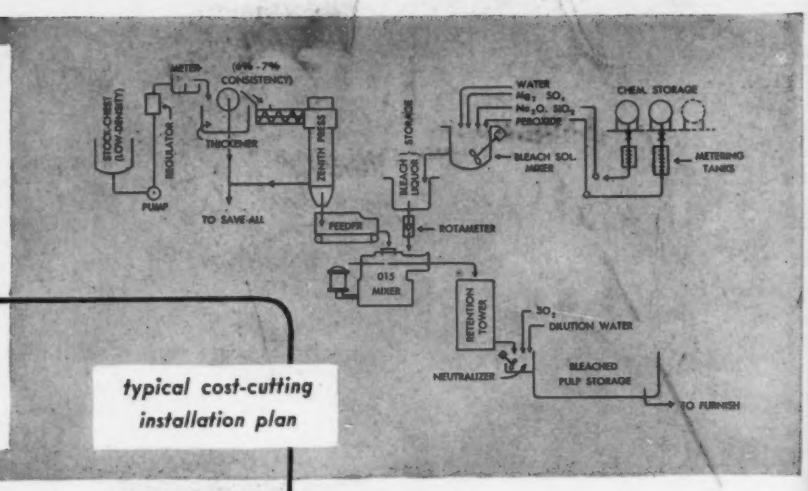


FROM raw water through final recovery, Nalco chemicals and services help produce better pulp and paper products...speed processing...save time and money. Details on the chemicals and services outlined here are contained in Nalco Bulletin 55. Write for your copy today—or ask your Nalco Representative for answers to your problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE Nalco SYSTEM • Serving the Paper Industry through Practical Applied Science

Jackson and Church — HIGH DENSITY SYSTEM



typical cost-cutting installation plan

INCREASE BRIGHTNESS . . . DECREASE COSTS!

Recently, exhaustive tests using the J-C High Density System were conducted under actual mill conditions. These tests proved conclusively that the J-C System saves 12.8 pounds of bleach per ton of groundwood pulp. For a 150 ton plant this means a saving of 1920 pounds of bleach in one day's operation! Benefits from high density bleaching of sulphite pulp are even greater.

A TYPICAL RECORD OF THE SAVINGS REALIZED FROM THE J-C HIGH DENSITY SYSTEM

From the graph it will be found that at 5% consistency the points brightness increase per point of peroxide is 0.265; and at 40% consistency it is 0.393.

For ten points brightness increase, there will be required, per ton of pulp

@ 5% — $\frac{10}{.265}$ = 38.7 lbs. H_2O_2 per ton

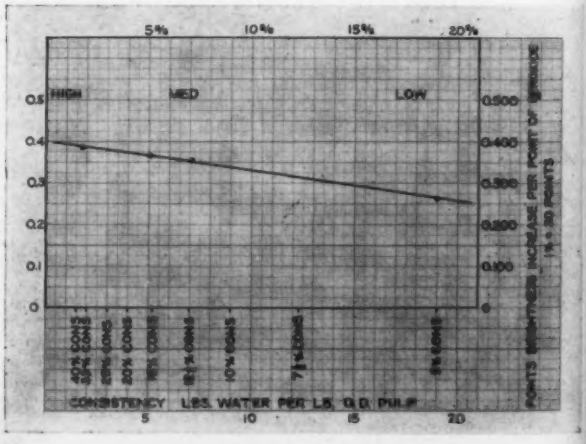
@ 40% — $\frac{10}{.393}$ = 25.4 lbs. H_2O_2 per ton

Saving = 13.3 lbs. H_2O_2 per ton of pulp

Thus for a production of 150 tons per day, assuming 350 working days in the year and a cost of 28½c per lb. for H_2O_2:

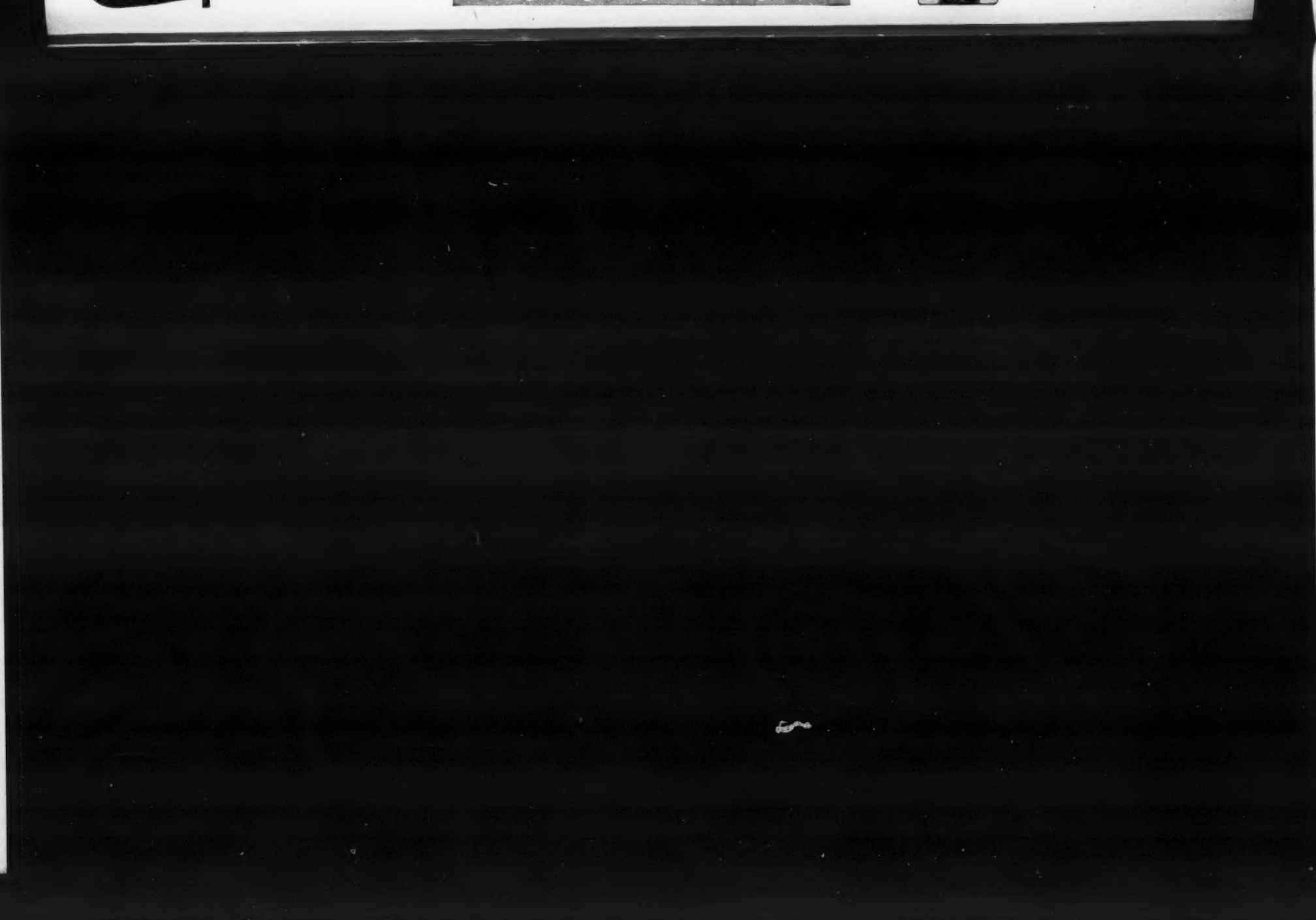
(Saving) 13.3 x $0.285 x 150 x 350 = $200,000.

The J-C Zenith Press and J-C Mixer are especially designed for use in handling the high consistencies possible with the Jackson & Church High Density System.



Our engineering department is available for cost analysis

JACKSON & CHURCH COMPANY • SAGINAW, MICHIGAN



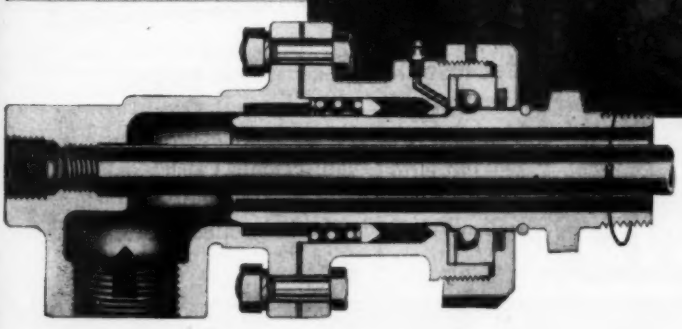
"Your JOINTS really solved a Problem for us!"

Says MAINTENANCE ENGINEER in this Paper Converting Plant

- Free-Floating, Low Torque Installations.
- Up to 50% Power Savings.
- Better Temperature Control.
- Low Maintenance, No Adjusting.
- All Parts Easily Accessible.

LOW TORQUE (freedom from friction drag) is the key to Barco's *"free-floating"* revolving joint installations. With this type of installation, Barco offers numerous advantages: power savings as high as 50%... very low maintenance requirements... quick, easy accessibility of parts... better temperature control... ability to withstand vibration and hard usage.

Take a look at Barco's new Type IBR Revolving Joint. Note the wide spacing between bearings which holds bearing loads and wear to a minimum. *Let us give you the complete story; ask for recommendations.* BARCO MANUFACTURING CO., 1826 M Winnemac Ave., Chicago 40, Ill. In Canada: The Holden Co., Ltd.



Left: Ability to stand up under high speed, continuous duty on large and small coating rolls has made these Barco Joints popular with the user.

For complete information on this new Type IBR Revolving Joint, send for Bulletin 300.

BARCO *Revolving* JOINTS

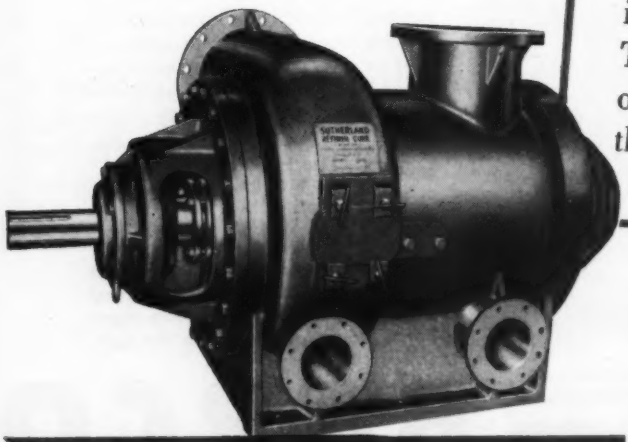
For Paper Machine Dryers, Calenders, Paper Converting Equipment

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

SELECTIVE DEFIBERING

When your brown stock or wash stock passes through a Sutherland Breaker Trap, here's what happens:

First, heavy tramp metal is pulled out quickly by centrifugal force. Then the selective defibering action goes to work and reduces soft, over-size fiber bundles. Hard dirt particles and other forms of waste material are left whole so they can be removed by standard screening methods. Thus the Breaker Trap gives an increased amount of usable fibers, while aiding in the maintenance of a clean sheet.



Because the Breaker trap is designed specifically for this duty, it features rugged construction, high efficiency and low power requirements. Capacities are available for both large and small mills. Write today for illustrated folder.

SUTHERLAND

Patent pending

Breaker Trap

SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 8 • NOVEMBER, 1952

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If you're losing money on an old crane or shovel, let's put a new 3/4-yard American Crawler to work for you... *right now*. You'll never know how many extra loads one man can move in a day until you see him handle the new American. We've cut his legwork by 60%... given him comfort and easy control undreamed of in older machines. The American Crawler is available as crane, shovel, pull shovel or dragline. Every item in today's news says *now is the time to buy.*

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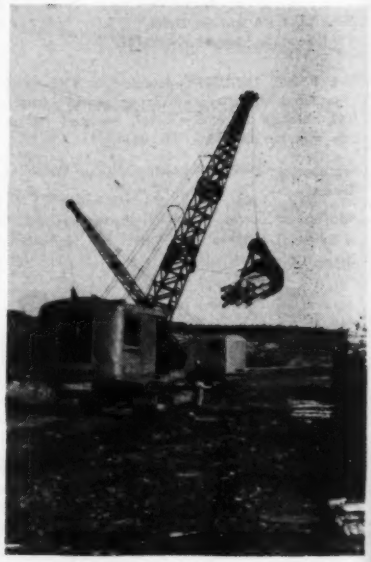

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& Derrick Company
ST. PAUL 1, MINNESOTA

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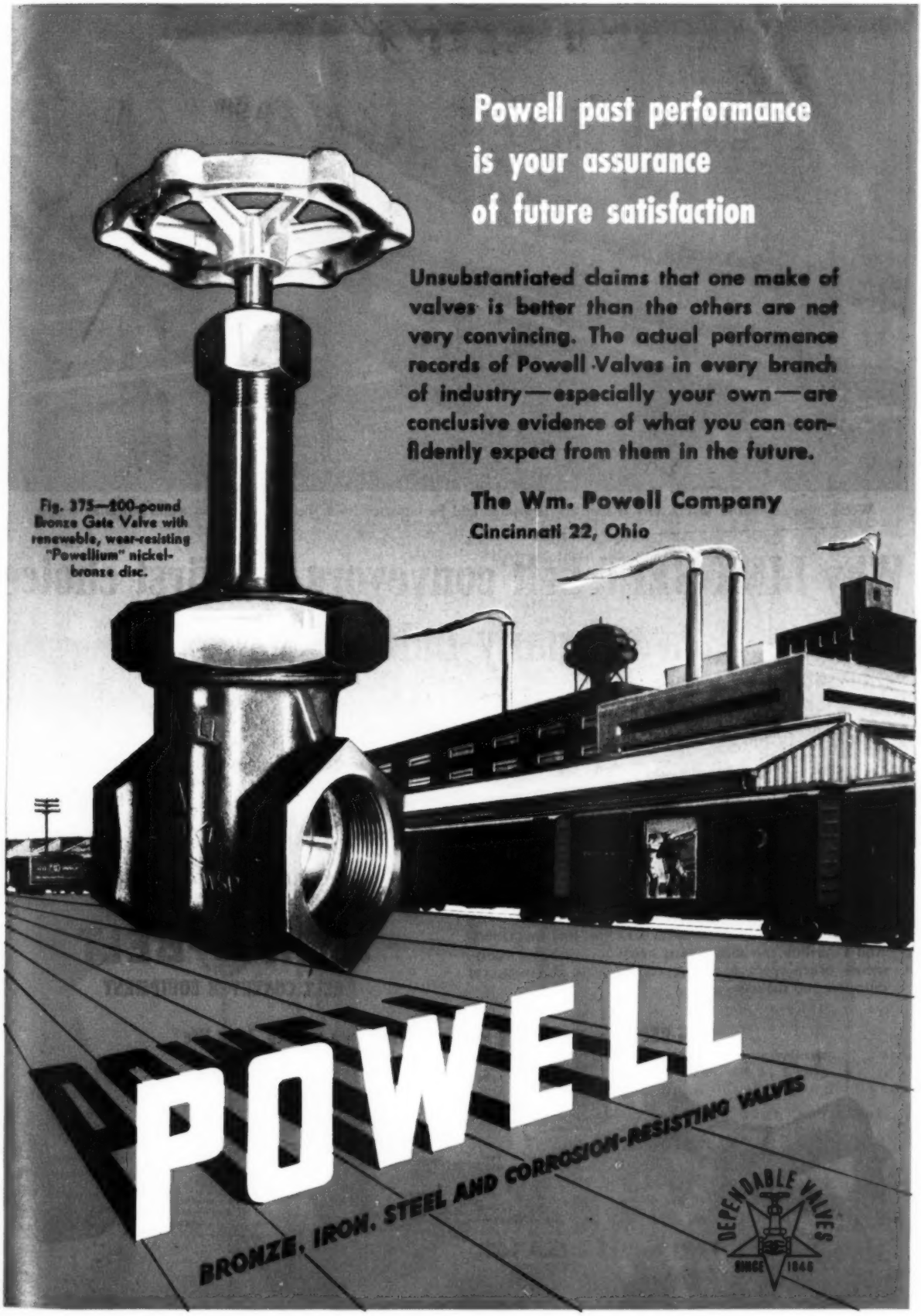
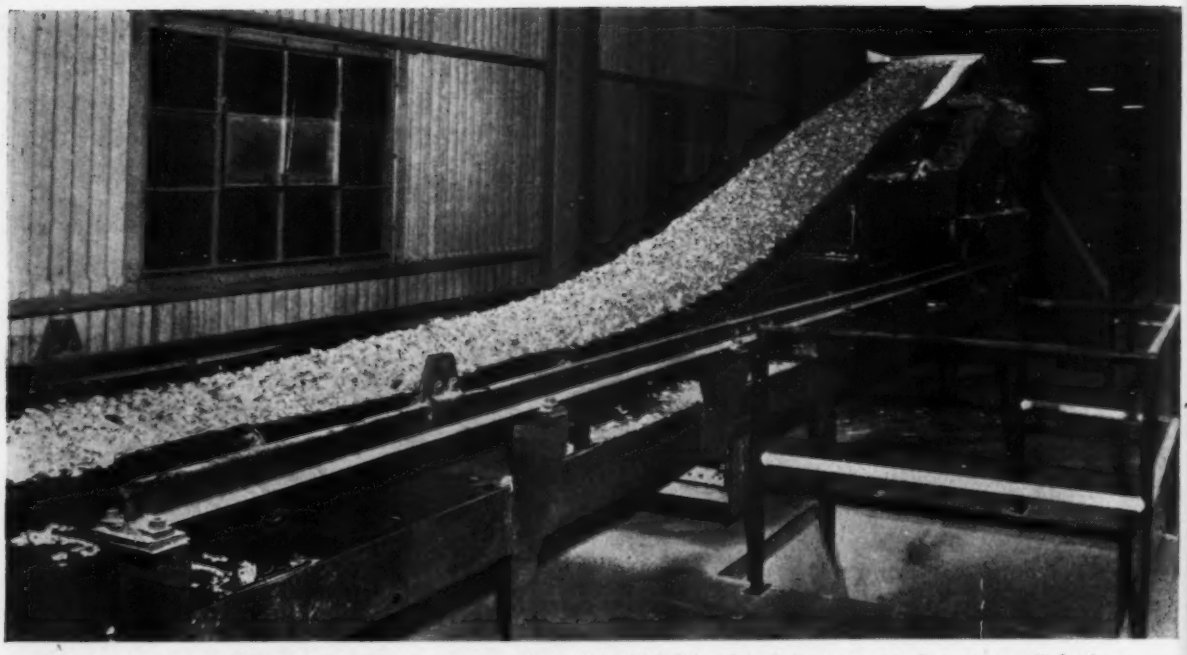

Powell past performance
is your assurance
of future satisfaction
Unsubstantiated claims that one make of valves is better than the others are not very convincing. The actual performance records of Powell Valves in every branch of industry—especially your own—are conclusive evidence of what you can confidently expect from them in the future.
The Wm. Powell Company
Cincinnati 22, Ohio
Fig. 375—300-pound Bronze Gate Valve with renewable, wear-resisting "Powellium" nickel-bronze disc.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846



Wood chips are carried to digesters at southern newsprint mill by Link-Belt 36-in. belt conveyor and motor-propelled tripper.

Why LINK-BELT belt conveyors are first choice in so many industries . . .

Engineering experience plus quality components combine to cut handling costs

EFFICIENCY in moving materials makes the difference between profit and loss in many operations. That's why it's so important to make sure you get the *right* belt conveyor system for your needs.

And there's no surer way of meeting your specific operating requirements than by calling in Link-Belt. Our belt conveyor specialists can efficiently engineer the system and recommend the correct components from Link-Belt's complete line of idlers, trippers and terminal machinery. And Link-Belt can match your needs in associated equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

Equally important, with such a tremendous background in belt conveyor application, Link-Belt is in an ideal position to follow through on every detail of your job—from planning through erection, if desired. One source—one responsibility.

Link-Belt will gladly work with your engineers or consultants. There's a Link-Belt office in the principal city near you.

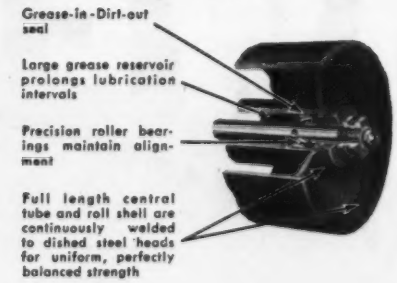
LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, Duluth 2, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities. 12,720-B

LINK-BELT

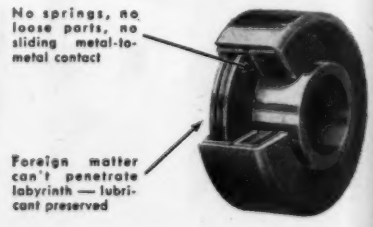
BELT CONVEYOR EQUIPMENT

LINK-BELT Roller Bearing Idlers provide free-rolling, long life

Standard for Industry—L-B "100" Idler


Grease-in-Dirt-out seal
Large grease reservoir prolongs lubrication intervals
Precision roller bearings maintain alignment
Full length central tube and roll shell are continuously welded to dished steel heads for uniform, perfectly balanced strength

Less lubrication and adjustment


No springs, no loose parts, no sliding metal-to-metal contact
Foreign matter can't penetrate labyrinth — lubricant preserved

Grease-In-Dirt-out Seal

Surface
Density
can be
controlled with

KELSIZE
and
KELGIN

These hydrophilic colloids effectively regulate surface density when applied as a 0.20% to 3.5% solution from calender stack or size press.

Outstanding advantages obtained are:

Uniformly smooth finish
Improved Gloss Ink Printing
Greater Wax and Oil Resistance
Uniform Pigment Coatings

Try KELSIZE or KELGIN and MEASURE the difference.

Picture of Gurley Densometer.
Courtesy of W. & L. E. Gurley

Kelsize and Kelgin®...
products of
KELCO
company

31 NASSAU STREET
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20 N. WACKER DRIVE
CHICAGO 6

530 W. SIXTH STREET
LOS ANGELES 14

at the operator's command

Everything from Hydrapulper* conveyor clear thru to jordans or machine headbox "snaps to attention" at the operator's command. There he stands—lord of all he surveys, alert to lights and gauges, flipping levers or pressing buttons. And what happens! Conveyors, Hydrapulpers, Junk Remover*, Ragger*, Hydrafuges*, Classifiners®, Disintegrator*, Selectrap*, HYDRAFINERS®, jordans, pumps and agitators instantly react to the authority of his touch.

That, my Dear Sirs, is paper stock preparation in the modern remote control tempo and we are proud to have been able to contribute such a system to the Industry.

- **Specialists in remote control stock Preparation Systems**
- **Specialists in panel board design**

*Trade Mark

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BROS. MACHINE CO.
MIDDLETOWN, OHIO

DILTS MACHINE WORKS, Fulton, New York
Divisions of THE BLACK-CLAWSON COMPANY, Hamilton, Ohio
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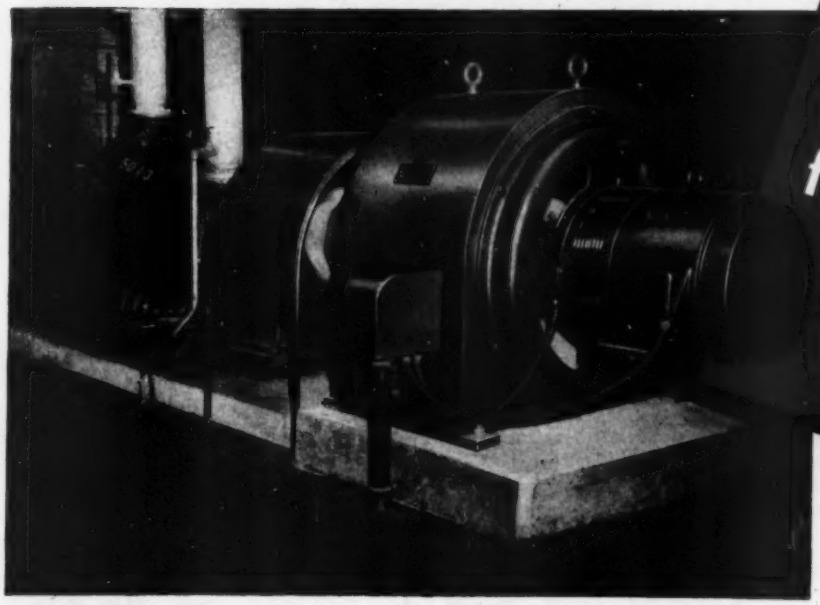
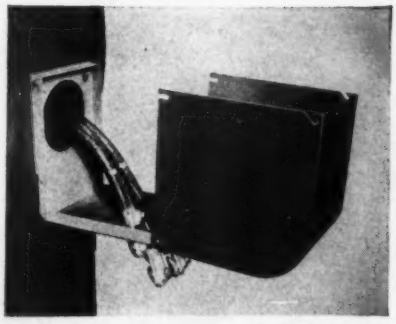
ELLIOTT SYNCHRONOUS MOTORS



a new high in dependability for pulp and paper mill drives—

Bracket type Elliott Fabri-Steel synchronous motor driving Jordan.

Whether you need synchronous, squirrel-cage, wound rotor, or direct current motor drive,



Large, easily accessible conduit boxes are standard on all Elliott motors. Drip-proof box above plus long leads and clamp-on type connectors make connections a simple task, and provide adequate protection. Splashproof type conduit boxes also available, providing same ample size and ease of accessibility.

Select ELLIOTT—because

● **Long established reputation**—manufacturers of dependable motors and generators for over half a century.

● **Pioneering achievement**—many outstanding features in motors today originated in Elliott Engineering Department.

● **Advanced engineering**—completely re-designed line of motors and generators since World War II. The new FABRI-STEEL design provides:

New bumpproof strength . . . Rigid, light bearing brackets . . . Ease of accessibility . . . Improved ventilation . . . Reduced maintenance cost. Write for descriptive bulletins.

L-816

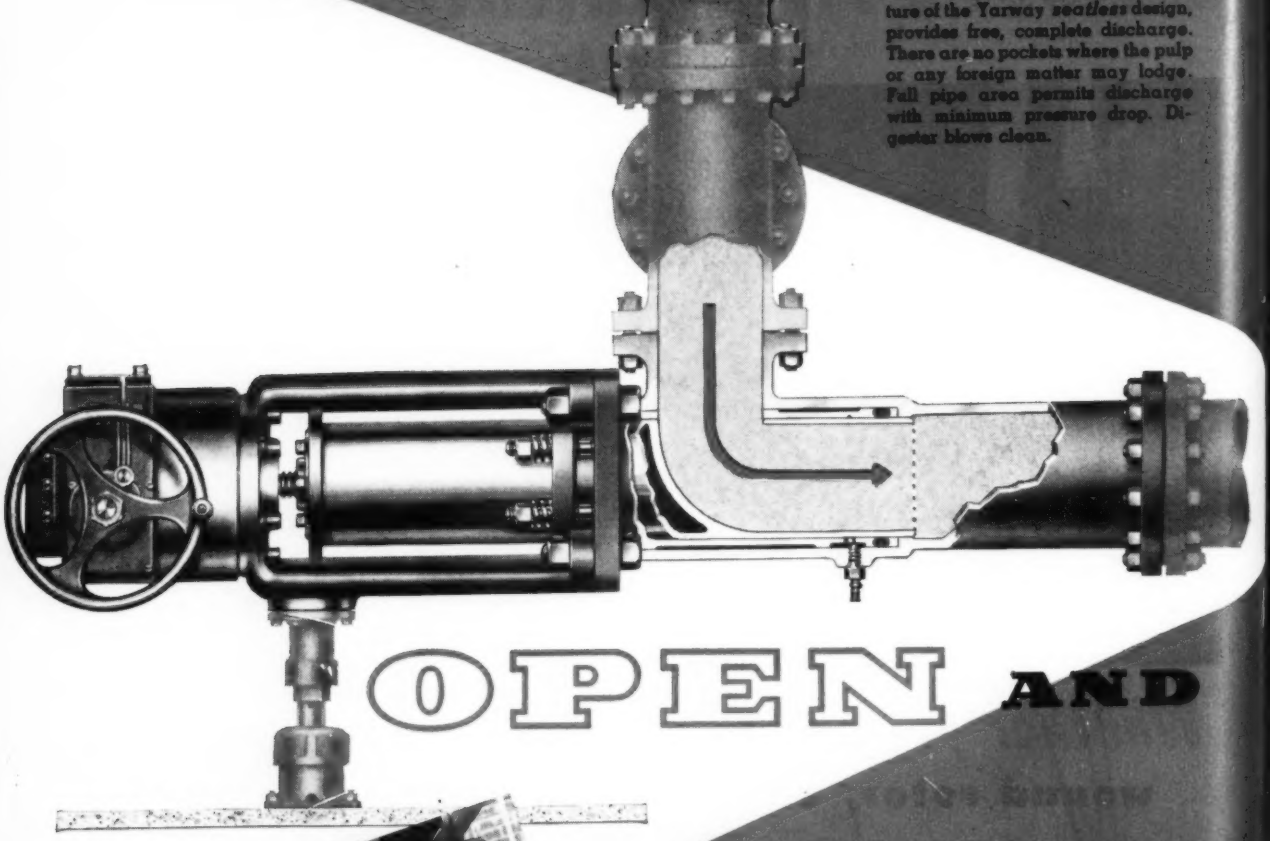
Elliott FABRI-STEEL MOTORS AND GENERATORS

ELLIOTT Company

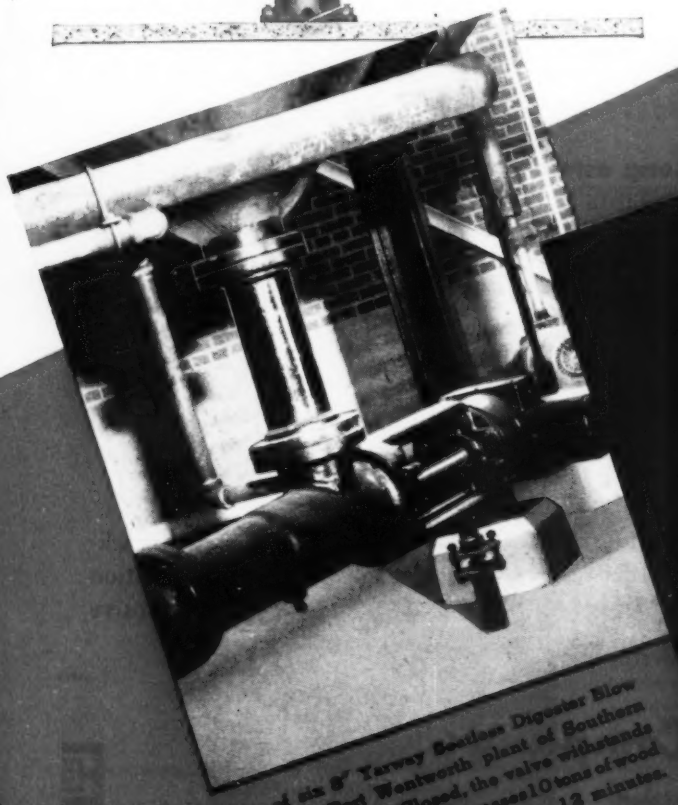
Ridgway Division
RIDGWAY, PA.

FOR MOTORS 1—200 HP:
CROCKER-WHEELER DIV., AMPERE, N. J.
Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

FREE DISCHARGE: See how the hollow sliding plunger, prime feature of the Yarway *seatless* design, provides free, complete discharge. There are no pockets where the pulp or any foreign matter may lodge. Full pipe area permits discharge with minimum pressure drop. Digester blows clean.



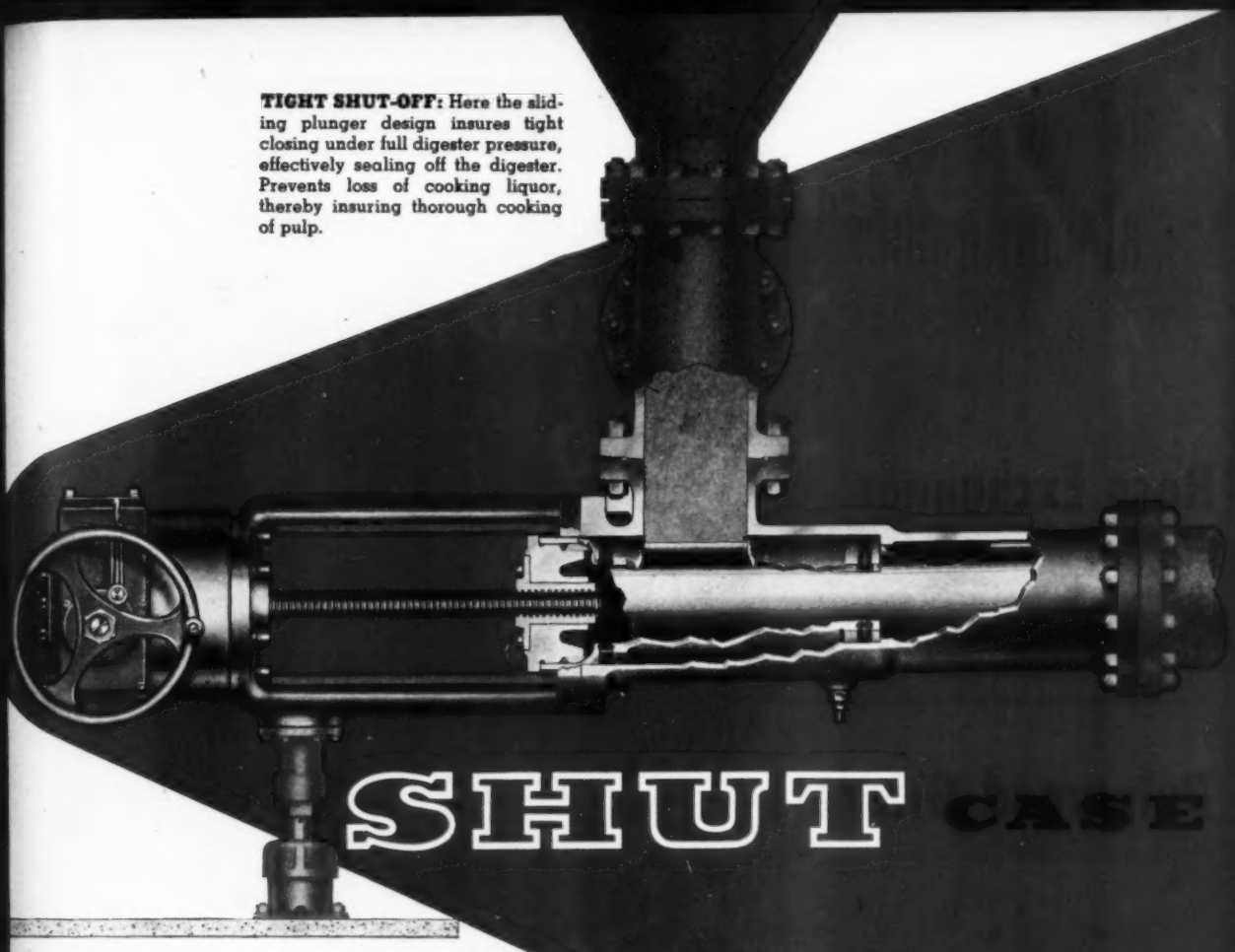
OPEN AND



One of six 8" Yarway Seatless Digester Blow Valves at Port Wentworth plant of Southern Paperboard Corp. Closed, the valve withstands 150 psi. pressure; open, it passes 10 tons of wood pulp and used cooking liquor in 12 minutes.

Battery of 5 Yarway Seatless Digester Blow Valves installed on digesters at plant of Ce... River Newsprint Co., Coosa Pines, Al...

TIGHT SHUT-OFF: Here the sliding plunger design insures tight closing under full digester pressure, effectively sealing off the digester. Prevents loss of cooking liquor, thereby insuring thorough cooking of pulp.



SHUT CASE

FOR YARWAY

DIGESTER BLOW VALVES

These two cross-section views of the Yarway Seatless Digester Blow Valve, in open and closed positions show two good reasons (free discharge and tight shut-off) why Yarway Valves are being used on more and more pulp digesters.

Besides the advantages inherent in the seatless design, Yarway Blow Valves have certain other important features:

FAST OPERATION—by remote push button control, these motor-operated valves speed digester discharge . . . in one typical mill, resulted in an increase of 20 tons of pulp a day.

RUGGED CONSTRUCTION—built to withstand the shock and wear of toughest service. Frequently take up to 6000 blows before reconditioning.

MODERN METALLURGY—such as lower gland (sleeve) of chromium nickel stainless steel and sliding plunger of hardened stainless steel—resists wear and chemical action.

If you are interested in *safety in operation, increased production, low maintenance, savings in labor*—then write for Yarway Bulletin B-440.

YARNALL-WARING COMPANY • 149 MERMAID AVENUE, PHILADELPHIA 18, PA.

Branch Offices in Principal Cities

to keep hydraulic fluid cool at continuously high speeds

Ross Exchangers are furnished with Roberts Pulpwood Grinders

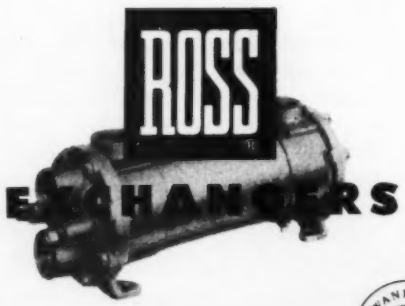
Roberts Pulpwood Grinders, like the one shown, are designed to turn out 50 tons or more every 24 hours, cutting operating costs as much as 70%.

Furnishing the driving force for the feed ring of this continuous, high speed machine, is an hydraulic power unit coupled with a fluid motor. Should the oil flow from the power unit drop below the required pressure, through overheating, production would naturally be slowed down.

But, Appleton Machine Company, the manufacturer, has made adequate provision against that. Roberts Grinders are safe-guarded by built-in Ross Type BCF Exchangers. Oil is thereby prevented from thinning out through overheating, robbing the pump of full capacity through slippage. One compact Ross unit maintains oil temperature at the most effective level.

Just as Ross Exchangers are used on other Appleton machines, such as super calenders, rewinders, machine and embossing calenders, on either lubrication systems or hydraulic pressure systems or both, so are they in wide use by other leading equipment makers serving the paper and pulp industry. Pre-engineering, standardization and mass production make the all-copper and copper alloy Ross "BCF" a very advantageous choice. For details, request Bulletin 1.1K5.

KEWANEE-ROSS CORPORATION
DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1430 WEST AVENUE • BUFFALO 13, N. Y.
In Canada, Horton Steel Works, Limited, Fort Erie, Ont.



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Serving home and industry

AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON

Sure, you have room for improve-ment

patent pending

You most likely will be pleasantly surprised how easily a Pressure Washing System can be installed in your present buildings.

Pressure Washing units are small, compact, and their methods of installation are extremely flexible.

In any event, Pressure Washing will benefit you handsomely through better recovery of chemicals, high solids to evaporators and low operating costs.

Write us today for illustrated folder on Pressure Washing

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Manufactured by **VALLEY IRON WORKS CO.,** APPLETON, WISCONSIN

Trenton 8, N. J.

Designed & Engineered by **SUTHERLAND, INC.**

When You Really NEED SERVICE!

WHEN WATER WELLS and Pumps fail, slow up in production or need servicing, Layne stands ready to answer your call with the world's largest *inventory of parts and supplies, the greatest number of rigs, the biggest staff of crewmen—and more years of experience than any other organization in the country. Furthermore, if obsolete parts are required, Layne has fully capable engineers, machinists, foundrymen and factories for designing, casting and machining anything and everything needed for complete and efficient repairs. Layne service men know from actual experience just what can be done, and most important of all, exactly how to do it.

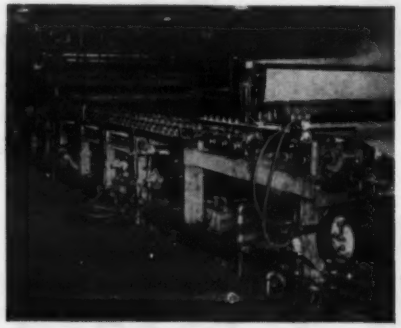
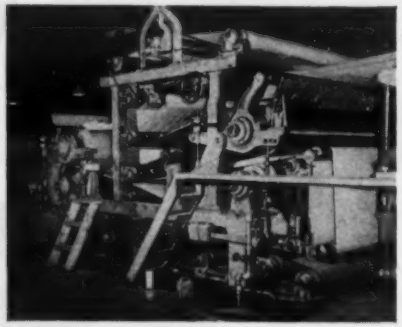
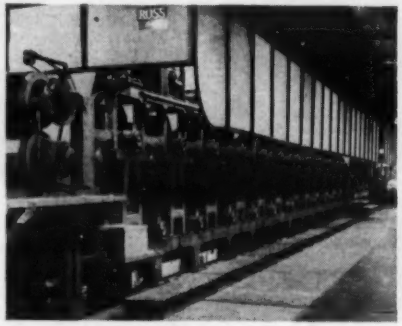
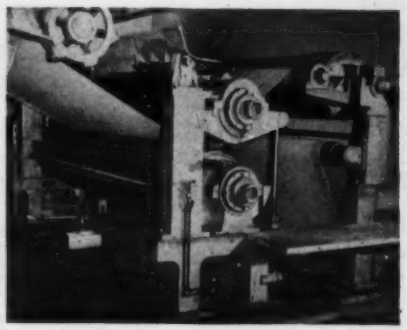
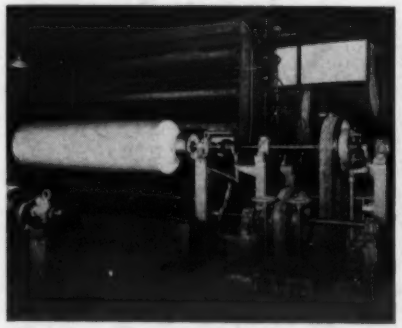
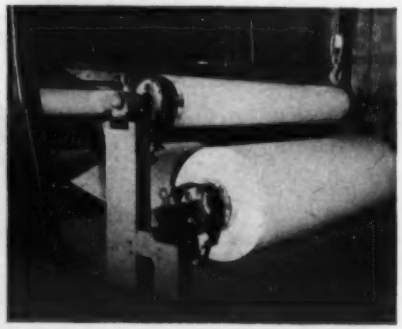
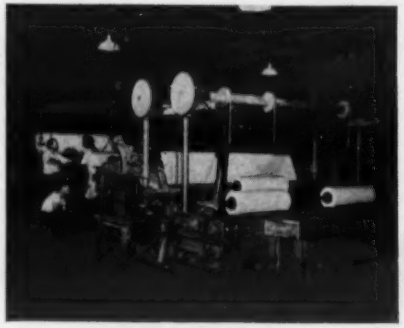
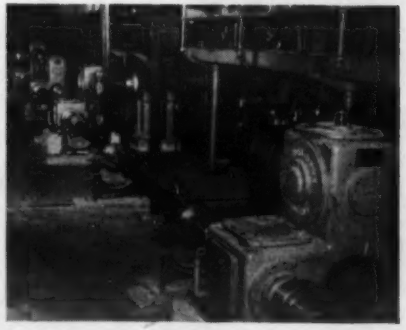
Advisedly, Layne keeps, safely filed, exact specifications and full details on all of their installations for instant use in both emergency and routine calls. If your water well or pump is not performing efficiently or is showing signs of possible failure, Layne will gladly make an inspection and give you a service job report. Address Layne & Bowler, General Offices, Memphis 8, Tenn.

*(*for all makes of pumps)*

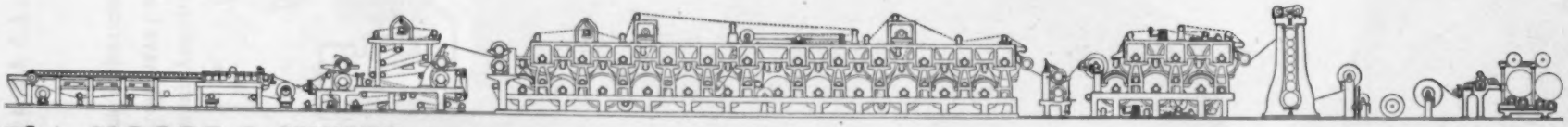
Layne

WATER WELLS

VERTICAL TURBINE PUMPS—WATER TREATMENT

Latest Moore & White Fourdrinier machine with 136" wire operating on specialty grades at Hopper Paper Co., Taylorville, Ill. Above views show various machine sections and Moore & White Syco-type machine drive.



The MOORE & WHITE Company 15TH STREET AND LEHIGH AVENUE PHILADELPHIA 32 PA. • CUSTOM-BUILT MACHINES FOR PAPER MAKERS

FORMULA

for performance . . .

. . . NOT SPECULATION

when you specify PERKINS Rolls. PERKINS Rolls have behind them the longest and broadest experience in the Roll-making industry.

B. F. PERKINS & SON, inc.

Engineers and Manufacturers

HOLYOKE • MASS.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

Human papermakers learned well from the wasp

As early as 1719, the celebrated naturalist, René Réamur reported the manner in which the wasp made paper from wood . . . where man used only rags and linen. Observing the world's first professional papermaker in action, Réamur learned that the wasp chews wood fibers, mixes them with a natural size and spreads this paste to dry into a paper substance for its nest.

Man may have been late in discovering what the wasp already knew . . . but modern paper products show how well he learned. Serving America's progressive paper industry for more than 30 years, Staley's sizing starches, adhesives, plasticizers and dextrin products improve quality in many of the nation's leading mills. Why don't *you* investigate the advantages of using Staley's reliable raw materials and expert technical assistance? For further details, contact your supplier—or write direct.

PIONEERS IN PRODUCTS FROM
Staley
CORN AND SOYBEANS

A. E. STALEY MFG. CO. Dept. PI-11, Decatur, Illinois

SIZING STARCHES
Staley makes a full range of starches and dextrins for beater, surface or calender sizing.

CORRUGATING AND LAMINATING
Choose Staley's finer corrugating starches, special laminating and bag adhesives.

COATING ADHESIVES
Staley Starches and Dextrins give better results for machine or regular brush coating.

PLASTICIZERS
"Sweetose" and Staley's Corn Syrup are ideal softening agents for glassine paper.

PULP MILLS have big stomachs...

Some folks call them digesters; some call them autoclaves or pressure cookers. They digest a belly-full of wood chips in the same way a man digests a beef steak—chemically and mechanically.

From that point forward papermaking is a succession of washings in clean water and of forming the beaten pulp into sheets. After the sheet has been formed the remaining water is pressed out through the open spaces between the threads of the felts and evaporated at the drier rolls.

You can't manufacture paper or board without felts. Every papermaker knows that. Most of them also know that you can't buy better felts than Hamiltons because no others remove water faster and none give finer finish to the sheets than Hamilton Felts.

Hamilton Felts

MIAMI WOOLEN MILLS

Established 1858

With more than 300 different styles from which to select, the Hamilton sales engineer is in position to suggest the best felt for your purpose.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

THIS MORDEN COMBINATION

Saves SPACE • POWER
LABOR • MAINTENANCE

SLUSH-MAKER
STOCK-MAKER

Simplicity keynotes the Morden systems of stock preparation. Experience shows that these systems give outstanding results in terms of efficiency and economy for quality control. A simple basic system is shown in the flow diagram, using...

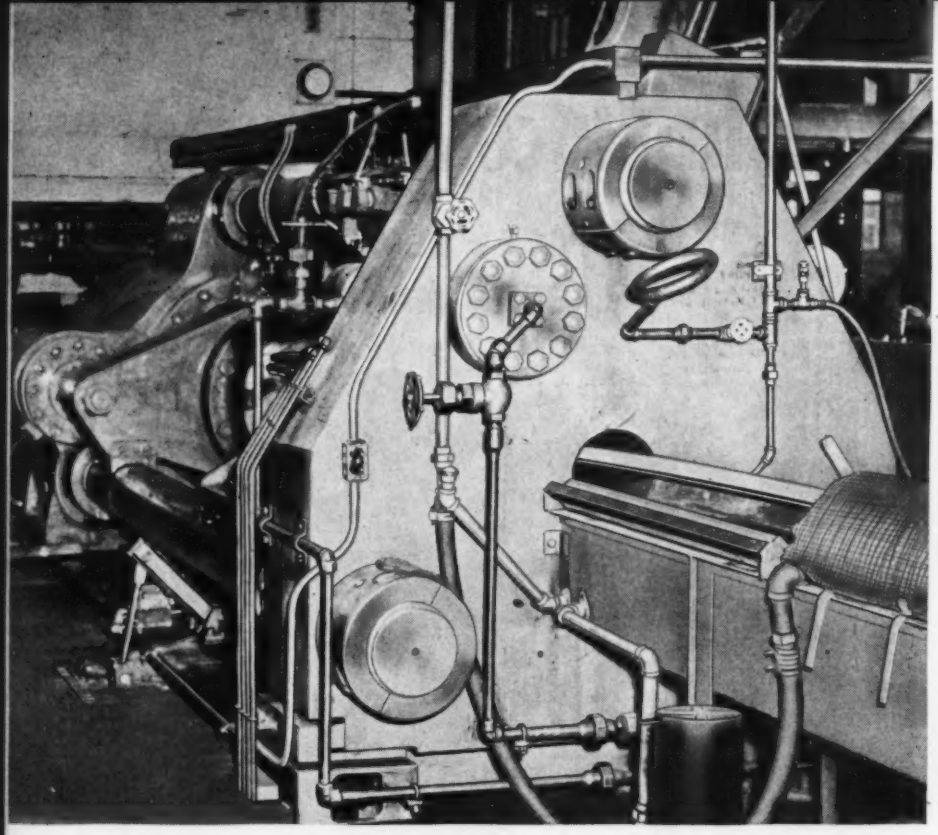
MORDEN "SLUSH-MAKERS" for completely pulping, deflaking, mixing and pretreating the furnish.

MORDEN "STOCK-MAKERS" for continuously beating and refining the stock ahead of the paper machine.

Many adaptations and elaborations of this system are used to suit various mill requirements. May we help you simplify and improve your preparation system with Mordens? Let us know your requirements.

SLUSH-MAKER
MORDEN
Machines Company
STOCK-MAKER

CORBETT BUILDING
PORTLAND 4, OREGON



Puts squeeze on hydraulic press maintenance...

• Shown above is the 1250-ton hydraulic press used by the Light Metals Corporation of Grand Rapids, Michigan, for extruding variously shaped sections of aluminum. When this press was installed recently, officials gave the important hydraulic oil job to STANOIL Industrial Oil. They based that decision on their own experience with this outstanding oil.

That experience covered over four years' use of STANOIL in the hydraulic system of a 315-ton extrusion press. STANOIL has served continuously in this press without being changed or removed for oil maintenance. The hydraulic oil system has never been cleaned and has remained entirely free from deposits and varnish. Hydraulic operation has been efficient at all times.

The experience of the Light Metals Corporation is your assurance of STANOIL's ability to reduce hydraulic system maintenance to a minimum in your plant. This versatile oil will provide clean, dependable lubrication for such a variety of equipment as air compressors, reduction gears, and electric motors. The Standard Oil lubrication specialists will help you make the most effective use of STANOIL. Phone him at your local Standard Oil (Indiana) office. Or write, Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

STANOIL
TRADE MARK
Industrial Oil

What's YOUR problem?

D. R. Clay, of Standard Oil's Grand Rapids, Michigan, office, is the lubrication specialist who has helped Light Metals Corporation keep maintenance of hydraulic units at a minimum through use of STANOIL Industrial Oil.

He is one of many Standard Oil specialists located throughout the Midwest. These men have the practical experience and special training to handle lubrication problems on any type of operation.

Take advantage of the service offered by the lubrication specialist nearest your plant. You can contact him easily by phoning your local Standard Oil Company (Indiana) office. With his help, find how many different oils in your plant can be replaced by STANOIL Industrial Oil on such applications as:

Air compressors . . . no sticking or clogging of valves, less oil consumption in splash or circulating systems.

Speed reducers . . . less wear of gears and bearings during frequent cold starts or prolonged high-temperature operation.

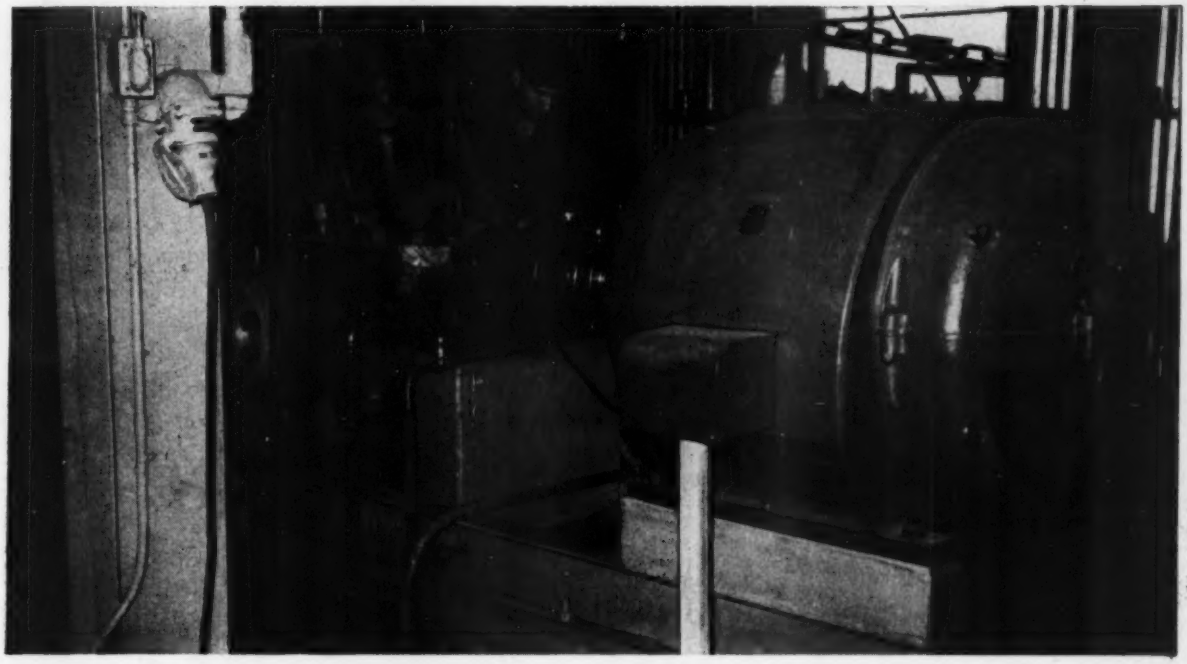
Steam turbines . . . freedom from emulsions and sludge, fewer oil changes necessary.

Ring-oiled bearings... rings function immediately on starting, less bearing wear.

Circulating and bath systems . . . one oil for a wide variety of jobs.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*

35 Starts a Week!



J. B. Wilt, Manager of Spaulding Pulp and Paper Company of Newburg, Oregon, says: "We have found our 500 hp E-M Induction Motor equal to every demand placed upon it. It has been entirely satisfactory in performance and has handled capably the frequent starts to which it is normally subjected."

Spaulding's E-M 2-Pole Induction Motor WITHSTANDS SEVERE STARTING DUTY

What do you expect from high-speed motors? At Spaulding Pulp and Paper Company they expect plenty . . . and get it. Their 500 hp, E-M Heavy-Duty 2-Pole Induction Motor is making an average of *35 starts a week* driving a hydraulic barker pump. This is a grueling test of good 2-pole motor construction . . . the powerful magnetic forces due to starting current inrush put a tremendous strain on the motor.

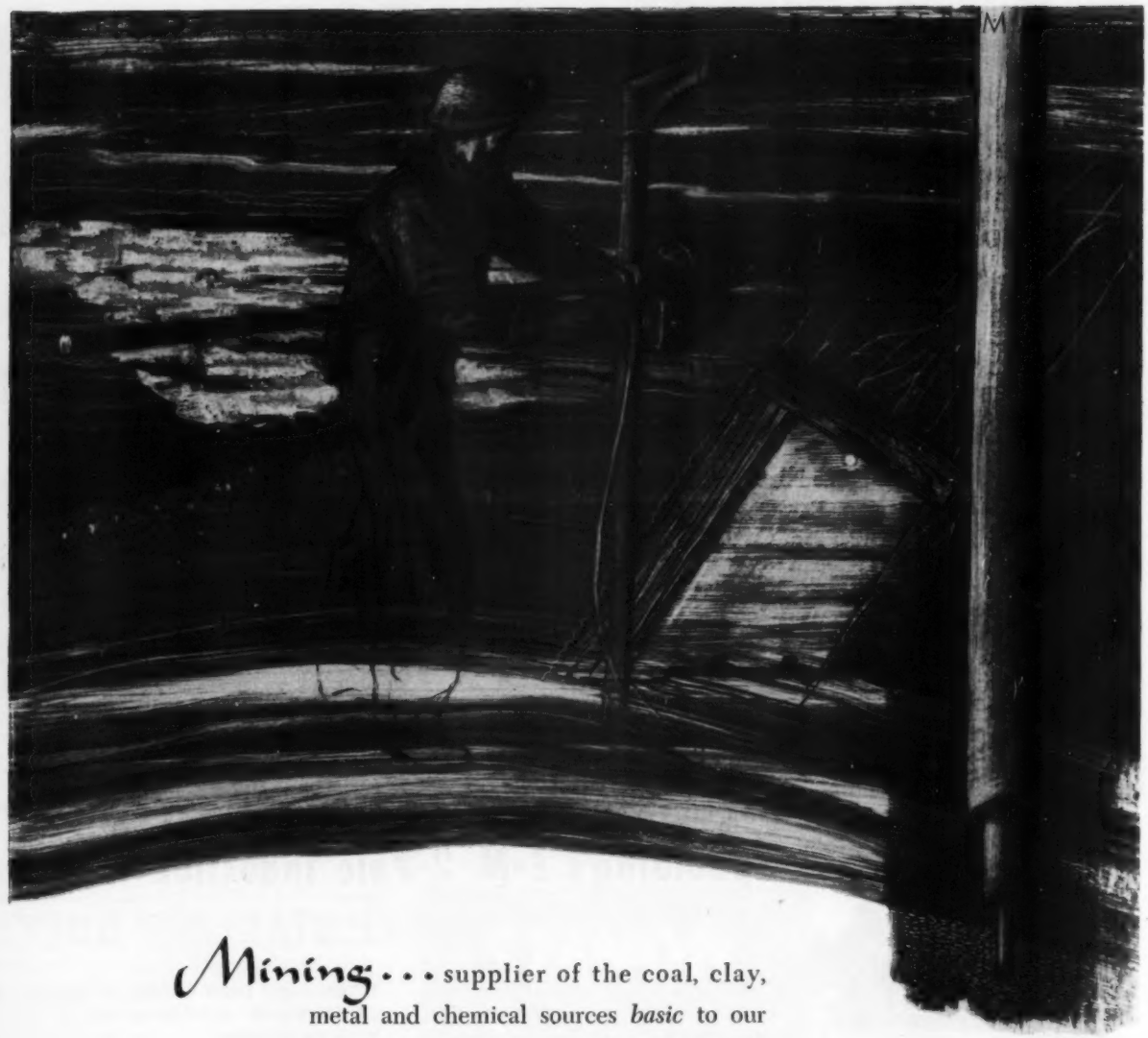
Tough starting is not the only difficult service. E-M motors can be built with the extra capacity needed to withstand unusual load conditions, high ambient temperatures, high peak loads, or special atmospheric conditions which it may encounter.

Day-in, day-out, this 3580 rpm motor at Spaulding is giving smooth, cool running service. This barker pump motor is an example of exacting pump, blower, and compressor duty, on which E-M motors give top performance. And this is the kind of service E-M can give *you*—Contact your nearest E-M Field Engineer for details—he's an experienced Engineer who can give you competent advice and application information on all types of drives.

13.0-TPA-2097B

ELECTRIC MACHINERY MFG. COMPANY • MINNEAPOLIS 13, MINNESOTA

Specialists in BIG MOTOR ENGINEERING



Mining . . . supplier of the coal, clay, metal and chemical sources *basic* to our national economy . . . *vital* to the paper industry.

Fourdrinier Wires . . . vital, also, to the paper industry, have received at Appleton Wire Works, Inc., the intense focus of 56 years of experienced research . . . resulting in the *earned* acknowledgement that *"Appleton Wires are Good Wires!"*

APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

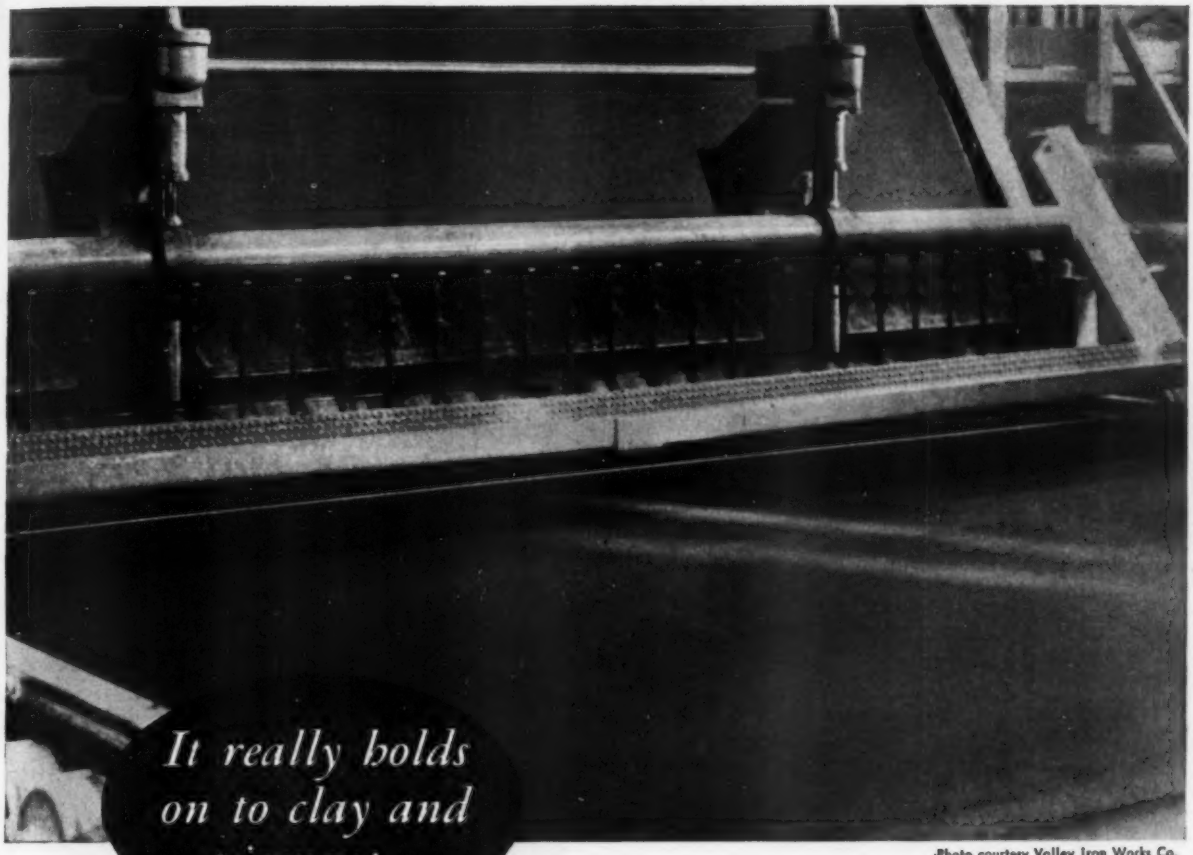


Photo courtesy Valley Iron Works Co.

One of the three big reasons why papermen prefer Swift's new process Glue

Yes, many successful book paper producers can tell of the unusually high retention of clay and titanium pigment achieved with Swift's new process Glue as flocculating agent.

Made by an exclusive process that assures a glue of exceptional purity and uniformity—Swift's new process Glue promotes greater retention of fibre and filler on the screens. Prevents the loss of valuable clays and titanium pigment in white water. Because it is a colloidally active water soluble animal protein, Swift's new process Glue helps in the even formation of the sheet.

Performance is economical, too. Works in low concentrations . . . requires no expensive agents in solution. Easy to prepare . . . easy to handle . . . non-foaming!

Check these reasons, too!

● **High Recovery in Flotation-type Save-all Systems!** Clearer effluents are obtained with Swift's new process Glue, thanks to its great ability to "flock" fibres and fillers. Economical and easy to use . . . produces consistently good results.

● **Higher Pick Test!** Swift's new process Glue is highly efficient in the production of paper that requires increased Pick Test.

As a partial replacement for starch in machine coating, it has shown greater film forming properties and tensile strength than a total starch solution.

Call **SWIFT** first for **GLUES**

SWIFT & COMPANY
Adhesive Products Department
Chicago 9, Illinois

This offer expires Dec. 31, 1952

Please send your 100-lb. introductory shipment of Swift's new process Glue at the quantity price, to be tested for use in our operations. We understand, if not fully satisfactory, it may be returned for credit at your expense.

*Name*_____ *Title*_____

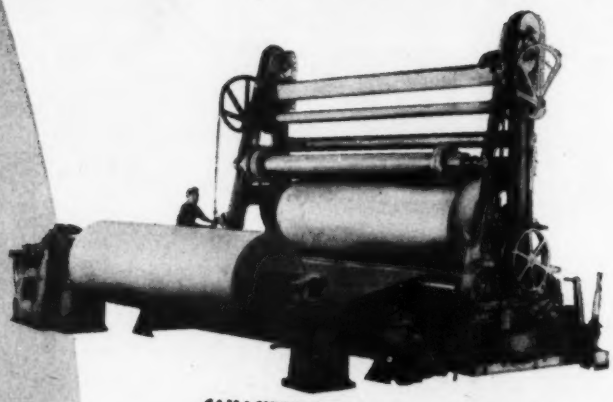
*Firm Name*_____

*Address*_____

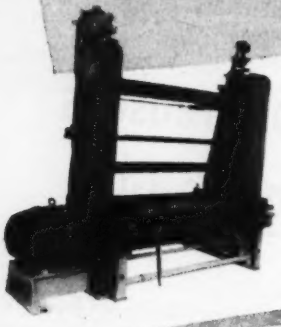
*City*_____ *Zone*____ *State*_____

Better Rolls

For two generations Camachines have set the top standards for quality in roll production. Every design feature of modern Camachines has been precisely engineered to help you produce rolls of finest quality . . . clean-cut, wrinkle-free and uniformly wound to the exact degree of "hardness" that you need. Camachine-made rolls stand up better in handling and shipping, and because of their uniform density they feed out with a smooth flow that means complete freedom from unwinding troubles. Ask your customers . . . they will tell you that Camachine-wound rolls are a better buy in every way!



CAMACHINE TYPE 19 One of the famous line of Camachine high-speed heavy-duty mill type winders.



CAMACHINE COMMANDER (Type 10). Popular heavy-duty slitter-rewinder for finishing rooms and converting plants.

at lower cost

Camachine winders and slitters are built to keep downtime, repair and replacement costs at a minimum. Even when operating at Camachine's record-breaking speeds, vibration and consequent wear are virtually eliminated. And when normal wear calls for replacements Camachine's trained service department stands ready to speed the shipment of new parts. Ask your maintenance men and they will tell you why Camachines stay on the job!

with less effort!

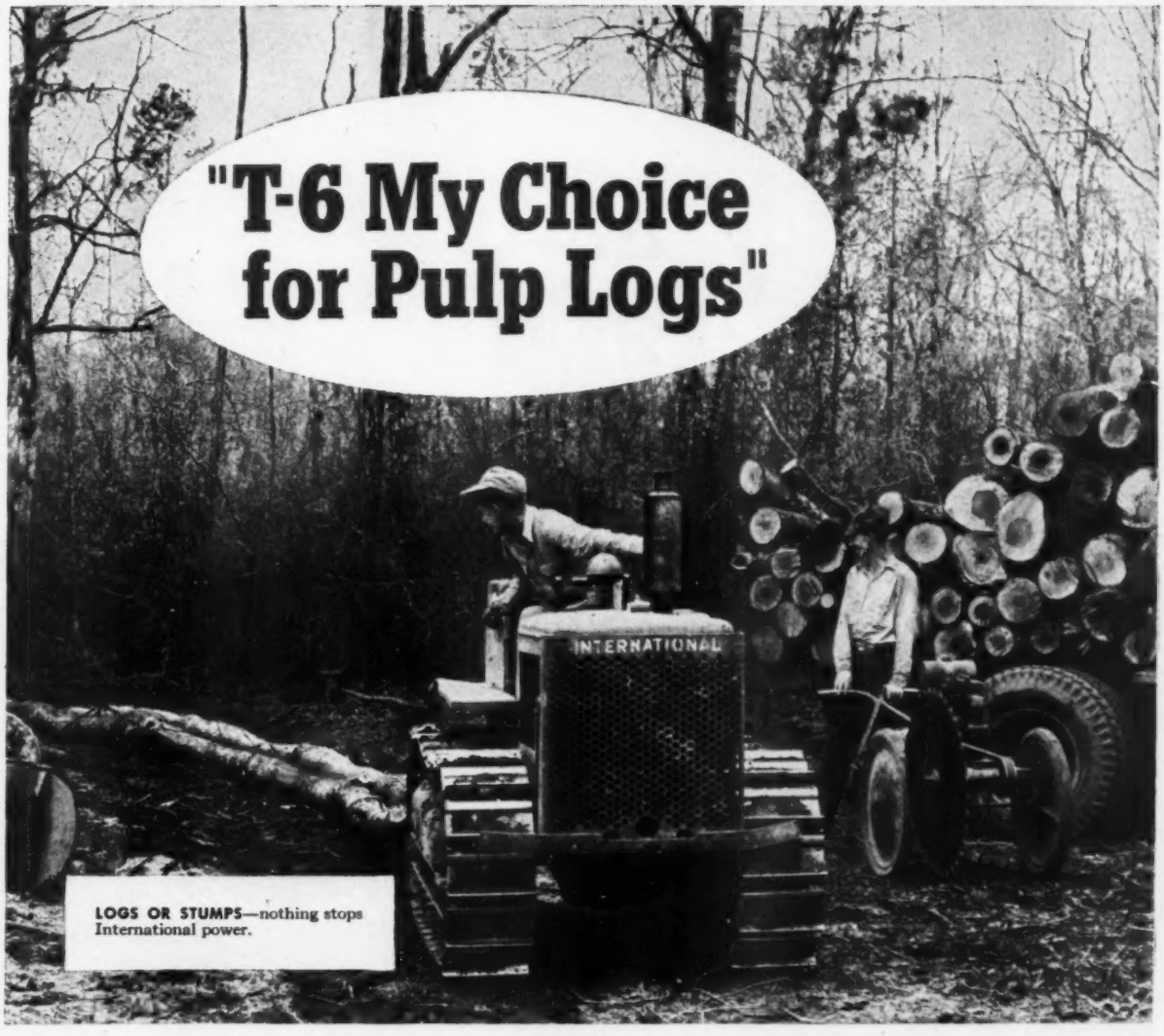
Camachine slitters and winders are easier on the operator. Simplified controls, handy facilities for accurate adjustments, and other important operating and safety features mean greater production with less operator fatigue. Camachine engineering developments of advanced design provide for faster starts, smoother braking and quicker roll changes. Easy accessibility and precision fittings make routine maintenance speedy and efficient. When you ask experienced operators they'll tell you it's Camachine for them, every time!

Camachine engineers will be happy to consult with you regarding fast, low cost production, of top-quality rolls.

(AA-2641)

Camachines®

CAMERON MACHINE COMPANY • 61 Poplar Street, Brooklyn 2, N. Y.



L. R. Manning, Jessup, Georgia, gets out 10 units per day on 7 gallons of gasoline

When there's pulpwood to be got from the river bottom land near Jessup, Georgia, it's International's T-6 that does the job.

"This narrow gauge T-6 is what we want to get out the pulpwood," says owner L. R. Manning. *"Today we got out 10 units on 7 gallons of fuel. The International T-6 is my tractor for pulp logs."*

Tough, rugged, the T-6 will fight its way through the roughest places to give you the speedy, efficient job you want.

See your International Industrial Distributor and ask him how International's economy and reliability can work for you.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

INTERNATIONAL INTERNATIONAL HARVESTER **POWER THAT PAYS**

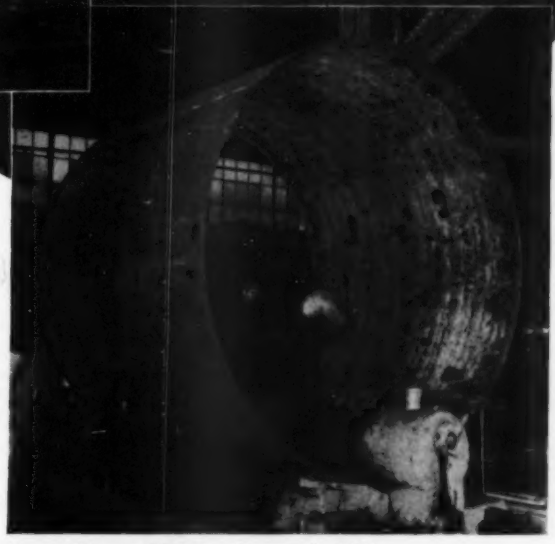
Appleton Felts

For... • DESIGN • FINISH • SERVICE
• UNIFORMITY • DEPENDABILITY

APPLETON WOOLEN MILLS APPLETON WISCONSIN

HORTON STAINLESS CLAD STEEL DIGESTERS

for the Weyerhaeuser Timber Company



Horton digester 11 ft. in diameter by 30 ft. 1½ in. high being fabricated of stainless clad steel for the Weyerhaeuser Timber Company's plant at Springfield, Oregon.

ABOVE is one of two 11 ft. diameter by 30 ft. 1½ in. high stainless clad steel digesters which we built for the Weyerhaeuser Timber Company's plant at Springfield, Oregon, in 1950. Clad digesters have the stainless material rolled together with the carbon steel portion of the plate as opposed to lined digesters wherein the lining is attached by welding.

Built in accordance with the 1950 Edition of the ASME Code for Unfired Pressure Vessels, the two digesters were designed for a pressure of 110 lbs. per sq. in. at a maximum temperature of 650 degrees Fahrenheit. They were given a hydrostatic test at 187 lbs. per sq. in.

Our facilities for designing, fabricating and erecting steel plate structures are complete. We build such structures from plain carbon steel, carbon steel clad with non-corrosive metals or from solid non-corrosive metals. We can also furnish corrosion-resistant linings whenever mill conditions require it. We have equipment for stress-relieving and x-raying shop built structures shipped complete or portions of field-erected structures where it is desirable to do so.

Our four large plants—at Birmingham, Chicago, Salt Lake City and Greenville, Pa., are strategically located to give pulp and paper mills efficient, reliable service.

Whether you are modernizing your existing facilities or building an entirely new plant, consider the advantages of utilizing our services. A partial list of equipment we build for paper and pulp mills includes . . . sulphate and sulphite digesters . . . diffusers . . . accumulators . . . Marx Savealls . . . pulp washing tanks . . . settling tanks . . . storage tanks. Write our nearest office for more complete information or quotations.

CHICAGO BRIDGE & IRON COMPANY

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Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2143 C & I Life Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D.C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

For a **Clean Liner Stock**

The 6" VORTRAP

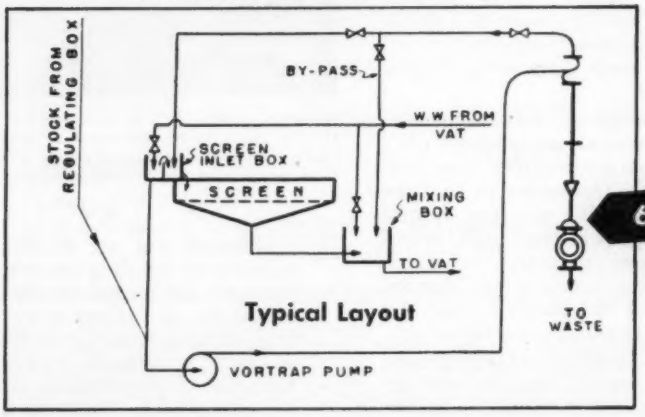
6" Vortrap with Waste Receiver

Featuring

1. **High cleaning efficiency.**
2. **Removal of large volumes of sand and foreign matter without plugging.**
3. **Manual or automatic discharge of rejects.**
4. **Simplicity of layout and operation—one unit will handle average cylinder vat.**
5. **Low power consumption.**
6. **Increased screen capacity.**
7. **Minimum space requirements.**
8. **Economies:**
   - (a) Upgrading of stock.
   - (b) Decreased shut down labor—fewer screen washups.
   - (c) More production.
   - (d) Increased wire-felt-equipment life.

6" Vortrap with Automatic Rejects Valve

Write for Sales Bulletin No. 11.



Typical Layout

NICHOLS ENGINEERING & RESEARCH CORPORATION

70 Pine Street — New York 5, N. Y.

40 So. Los Robles Ave. Pasadena 1, Calif.—1477 Sherbrooke St., W. Montreal 25, Canada

Dependable Source for Paper-Making Chemicals

Burke E. Cueny, of Butler Paper Co., inspects paper samples.

How product knowledge can help sales

Paper executive points up value of keeping informed on progress in paper making . . . cites use of Wyandotte Purecal M in finish

"I think the use of PURECAL M in paper finish is one of many developments in our industry which every paper salesman should know," says Burke E. Cueny, vice president and general manager of Butler Paper Company, Detroit. "He can't help but profit from such knowledge.

"In my experience selling letterpress and offset printing and now selling paper, I find that the more information I have on how paper is made and finished the more valuable I am to my employers and customers.

"Purecal is a real quality worker in a paper finish. It insures more whiteness and uniformity, takes ink well, and dries quickly. Customers of mine, using paper finished with Purecal, are never hard to resell on the same sheet."

BULLETIN BOARD

Soda Ash, Caustic:
Supply of these chemicals is currently good; and we are expanding our production facilities, assuring a reliable supply to meet growing demands of the paper industry.

Carbose*:
New Wyandotte Carbose VL is the lowest-viscosity sodium carboxymethylcellulose ever available. It is now being used with outstanding success in calender stock applications. Production of Carbose VL is being expanded to meet increasing demands. Details and samples free.

Kreelon*:
Experience has proved that Kreelon 40, Wyandotte's high-solubility alkylarylsulfonate detergent, in proper formulation, can improve the deinking of waste paper 10-20%. Let our representative call on you. Samples available.

To Paper Makers

Wyandotte PURECAL M is a pigment of highest purity for paper coating. It is ultrafine in quality and particle size, free of grit and other abrasives, readily and easily dispersed in water.

These inherent characteristics insure a uniform, smooth coating of high whiteness and good hiding power.

Act Now

If you are using PURECAL M in your coated papers, see that your sales force is capitalizing on it. If you are not using Purecal, write for complete data. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.* *REG. U.S. PAT. OFF.

Wyandotte CHEMICALS
FOR PAPER MANUFACTURERS

Looking for evaporator pumps?

Worthite pumps in multiple effect evaporators.

You can get the best in Worthington Worthite Centrifugal Pumps

By standardizing on a complete range of sizes in one superior stainless steel, Worthington can concentrate its volume and inventories. This means you can get the centrifugal pump and parts you need for handling corrosive liquids and other chemicals. Thousands of these Worthington *standard* pumps are now in evaporator service, pumping such widely varying liquids as black liquor, ammonium sulfate and frozen orange concentrate. Their advanced design and exceptional resistance to abrasion and corrosion assure best results at lowest operating cost.

FOR ALL EVAPORATOR SERVICES

Worthington has evolved a scientific method of selecting exactly the right pump for size, speed, head, capacity and NPSH. Let us show you how it works. For further facts proving *there's more worth in Worthington*, call your nearest District Office. Or write to *Worthington Corporation, Centrifugal Pump Division, Harrison, New Jersey.*

TYPICAL LEADING MANUFACTURERS OF EVAPORATOR SYSTEMS USING WORTHITE PUMPS

Buflovak • General American Transportation
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Swenson • Wilputte • Zaremba

WORTHINGTON

C-2.17

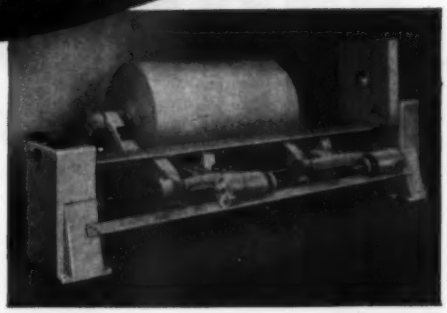
THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB

CENTRIFUGAL STOCK PUMPS
Type FP. Handle all kinds of stock up to 6½% consistency. 6 sizes. Capacities up to 6000 gpm; heads up to 140 ft.

GENERAL PURPOSE PUMPS
Type CN. Single stage. Sizes ¾ in. to 6 in. Capacities up to 2400 gpm; heads to 390 ft.

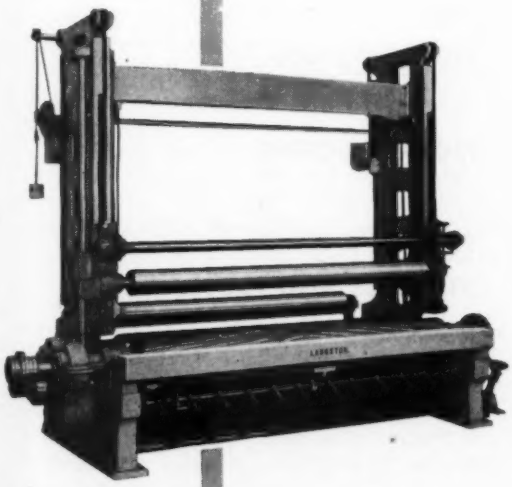
BOILER FEED PUMPS
Capacities up to 2000 gpm; pressures to 1250 psi.

LANGSTON SHAFTLESS *Mill Roll Stands*



Various types of Langston Mill Roll Stands are available, equipped with constant tensioning, side register control, etc. Special construction can be provided to receive customers' reels or unwinding shafts. Shaftless type, self loading Langston Mill Roll Stands also are available.

SAMUEL M. LANGSTON CO.
Camden, N. J.



Langston SLITTERS and WINDERS

Merfenel 51*

*PACKED IN ONE AND TWO OUNCE ENVELOPES

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MOLD PROOFING
•
PRESERVATION OF
STARCHES AND PROTEINS

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

The Paper Industry

November 1952

Pulp and Paper Industry's Changing Chemical Requirements

The pulp and paper and paper conversion industries always have been a lucrative market of the chemical industry. With present trends pointing to significant changes in the pulp and paper industry's chemical requirements, this market may become even more lucrative. The changing trends are therefore of tremendous importance to manufacturers of chemicals, whose products enter in ever increasing quantity and variety in pulp and papermaking and in paper conversion processes.

The quantities of chemicals involved in these changing trends will decide new and major expansions in the chemical industry. For instance, as indicated by a chemical market analyst in his survey of the pulp and paper industry market published elsewhere in this issue, should the present trend toward upgrading of mechanical wood pulp result in a general adoption of the hydrogen peroxide brightening process, the current production of 6,500,000 tons of ground wood pulp on the North American continent would require some 55,000 tons of hydrogen peroxide, which amounts to nearly three times the total 1947 U.S. output of this chemical. Caustic soda and chlorine manufacturers are following the current spectacular expansion of the industry's sulfate pulping facilities with keen optimism, since such expansion must result in increased caustic soda consumption and, therefore, strike a better balance in the caustic soda and chlorine utilization.

Then, there is the trend toward modification of the sulfite process entailing the replacement of the calcium bisulfite liquor with sodium, magnesium, or ammonium bisulfite liquor. A major swing toward upgrading of chemical pulps would require large quantities of additional bleaching agents such as hydrogen peroxide or chlorine dioxide.

Manufacturers of resins whose products are already finding wide application in the paper and paper conversion industries would find their production facilities taxed beyond present capacities should the recently developed paper honeycomb cores—which will be described in the next issue—find popular acceptance in the home construction industry.

APPA Sponsors Safety Standards

The decision of the APPA on October 17th to sponsor a safety program and, in co-operation with the National Safety Council, set up safety standards for the pulp and paper industry, is a logical development. It gives this Association, best qualified to deal with problems in the pulp and paper industry, an opportunity to apply its knowledge and experience in the implementation of the important program of reducing the accident frequency. This will include a study of all facts connected with accident occurrence, formulation of sound safety legislation, planning and implementing safety training programs, and in general devising engineering and educational measures for hazard elimination and accident prevention.

Statistics show that, during its 40-year period of existence, the National Safety Council may be credited with saving the lives of some 500,000 industrial workers. The accident frequency curve has steadily dropped from 35 accidents per 1000 in 1926 to less than 10 accidents per 1000 in 1951. In the case of non-member industrial establishments, the accident frequency rate is generally higher by about 70 per cent.

As is so often the case, more than a single cause can be responsible for any one effect and a number of remedies must often be used to correct any single disorder. This applies particularly to causes and prevention of accidents. The most simplified breakdown of accident-occurrence causes has led to the recognition of two main hazard groups:

(1) human failure to which are attributed 80 to 85 per cent of all industrial accidents, and

(2) unsafe working conditions which are responsible for 15 to 20 per cent of all accidents.

This widely adopted accident-occurrence ratio, apart from being oversimplified, is also quite misleading. As pointed out by Professor G. W. Harper at the Seventh TAPPI Engineering Conference, the application of this ratio has in many cases induced management to put the emphasis on correction of human weaknesses rather than on the elimination of physical hazards. It has been argued that, since human failure is responsible for 80 per cent of all accidents, it is the human factor in accident prevention that must be tackled first.

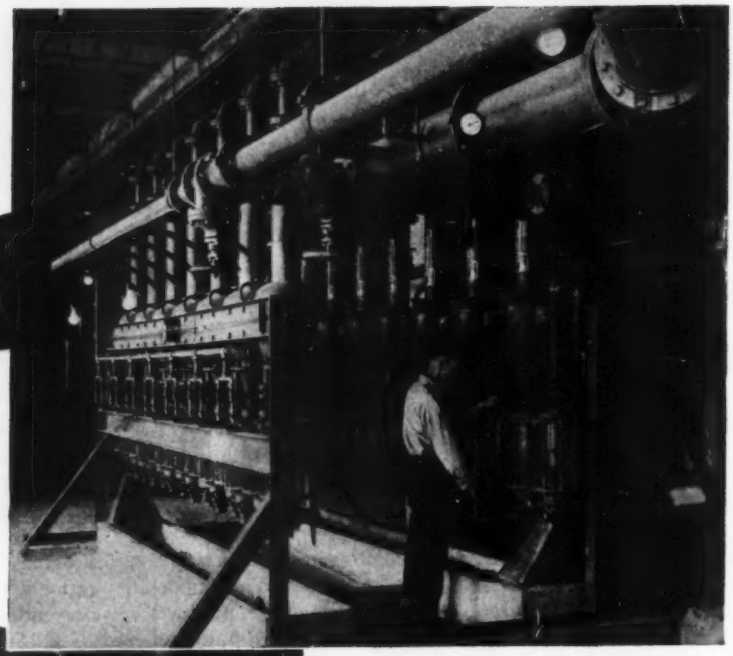
However, without detracting from or minimizing the necessity of teaching safe working habits to industrial personnel, it may also be argued that, in view of the magnitude of the human-failure factor, and knowing human nature for what it is, we can never hope to achieve a near 100 per cent elimination of accidents through the adoption of the training program alone.

A near 100 per cent accident reduction can be achieved only if equal emphasis is placed on what is often referred to as the engineering approach, the elimination of mechanical, electrical, and chemical hazards in so far as this is practical.

On Waste Paper Stocks, Too

DIRTECS

Do The Most Effective Dirt Removal Job



Here are two representative Dirtec installations among the dozens that are working on old paper and deinked stocks.

Dirtecs on such stocks, as on all other kinds of stock, produce uniformly clean, bright stock with negligible fibre loss. They take out such tough to handle dirt as asphalt and ink balls.

Dirtecs are easy to install and operate. The dirt collected is out of the stock for good and all — cannot get back into the system.

BIRD MACHINE COMPANY
South Walpole • Massachusetts

The Paper Industry Current Comment

Forestry and the wood supply . . . the atomic bomb . . . newsprint

While the United States Forest Service is interested, together with other government departments, in the development of lumber and pulp mills in the Alaskan national forest for the use of Japanese textile and paper mills, a notable group of top-drawer domestic paper company executives has been touring the South for a detailed study of the success of the forestry efforts of the paper industry in the southern pine belt. Nearly half a hundred men from more than a score of companies participated in this study of constructive methods for increasing the supply of pulp wood. Their visits demonstrated that scientific forestry can be practiced in such a way as to be commercially profitable, and that forestry does not have the sentimental value of preserving the trees alone. Some day the American public will realize that the commercial practice of forestry by the paper industry is one of the outstanding conservation programs of the nation—growing trees as a crop successfully.

While the Administration is considering the use of the Alaska forest for the industrial development of Japan, another significant movement is gathering headway in Europe. Various American companies are investigating European conditions with a view to establishing subsidiaries abroad. In some instances, such programs involve the utilization of cheap foreign labor to produce goods for the American market as a substitute for the production of such merchandise at the higher cost of American labor.

In another phase of this utilization of American wealth to build up foreign economies, the American paper industry is today facing low priced imports of paper and paperboard from Finland, produced in mills which were rebuilt and enlarged by loans of American money to Finland, where wage rates are only a fraction of those for identical jobs in this country.

The A-bomb and paper

A believe-it-or-not Ripley story comes out of a New York convention. Dr. W. A. Schenck, technical superintendent for Riegel Paper Corp., told the annual Packaging Institute convention that the A-bomb tests in Nevada have ruined photo-sensitized paper in the East. Several important companies, he said, have found there is sufficient radioactive content in the air wafted to the Atlantic Coast from Nevada to warrant the use of Geiger counters to prevent further contamination. Entire runs of photosensitive paper have turned black from this emanation, brought east with rain or snow storms. Another nationally known scientist told the same convention that the problem for the scientist dealing with radioactive isotopes is how to achieve such supervision that packaged material will not be ruined.

Newsprint and bagasse

The use of bagasse for newsprint is again in the news, with a report on the study of bagasse to the Celler newsprint committee of the House of Representatives by Secretary of Commerce Charles Sawyer. Sec. Sawyer said that the bagasse newsprint which has been produced is superior to ordinary newsprint, and that the available supply of bagasse is sufficient to take care of the nation's increased need for newsprint. Sawyer declared that, in addition to the bagasse studies, the department is working to determine the possible use of hard woods and other fibres as newsprint raw material.

While this country is talking bagasse for newsprint, Canada is finding that its currency premium over the American dollar is adversely affecting the profitable operations of its paper mills. There is more than a hint that rising production costs and currency exchange losses may result in a further increase in the price. An increase of $10 per ton is thought to be more than is needed to restore normal profitable operations to the Canadian producers. Of course, such an increase in price will accent the talk of the use of bagasse as a substitute for soft woods for pulp production.

Although United States publishers are talking newsprint shortage, the 15-nation International Materials Conference has decided to dissolve its pulp-paper committee because of the improved supply position in the world for pulp and paper. One factor listed for this action was an encouraging increase in exports from North American sources to other parts of the world, despite the sustained high level of American consumption. As a factor in this development, the domestic kraft paper industry has established an export association to operate under the Webb-Pomerene Law, which permits United States producers to combine for mutual development of export markets. The Kraft Products Manufacturers Export Association, including most of the major kraft producers, has been formed with Walter C. Shorter of Camp Mfg. Co. as president; Leonard Doyle, Union Bag & Paper Corp., as vice president, and Israel B. Oseas as secretary-treasurer.

Financial reports

A sharp drop in securities prices during the September-October weeks was not followed generally in the field for paper mill common stocks, while in many instances the quotations for preferred issues moved upward.

Net incomes

Carpenter Paper Co.—Net profit for the first six months of 1952 was $502,578 as compared with $921,620 for the same period last year.

Central Fibre Products Co.—Net income for the year to June 28 was $3,034,812, compared to $2,878,139 last year.

Central Paper Co.—Net income for

ST. REGIS PAPER'S PIPE LINE NOW DEFIES ROT

• A large diameter water line that must run under the ground, on top of the ground, up hill and down dale . . . that was the project of St. Regis Paper Company for their Bucksport, Maine plant.

The first pipe of untreated redwood lasted less than ten years. It was replaced with a line of "Wolmanized"* pipe staves —and when last inspected, was found completely satisfactory.

Wherever rot or decay is a problem, install "Wolmanized" pressure-treated lumber and get longer service life from your installation.

"WOLMANIZED" LUMBER *lasts 3 to 5 times longer than untreated lumber*

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Wolmanized PRESSURE TREATED **Lumber**
*Reg. U. S. Pat. Off.

the year to June 30 was $251,520, as against $546,157 last year.

Champion Paper & Fibre Co.—Net income for the quarter ended June 30 was $2,384,167 as compared with $2,549,830 for the comparable period last year.

Chesapeake Corp.—Net profit for twelve weeks to March 23 was $661,187, as $758,682 for the same period a year ago.

Kimberly-Clark Corp.—Net income for the year ended July 31 was $10,771,482, as compared with $11,949,361 in the previous fiscal year.

Marathon Corp.—Net income for nine months ended July 31 was $5,055,531, compared with $6,334,245 for the comparable period a year ago.

National Container Corp.—Net income for six months ended June 30 was $2,130,387, as compared with $5,870,181 a year ago.

Dividend declarations

Atlanta Paper Co. has declared a quarterly dividend of 10 cents per share on the common stock, payable September 30 to stockholders of record September 15.

Kimberly-Clark Corp. has declared a regular quarterly dividend of $1 per share on the 4 per cent convertible preferred stock, payable November 1 to stock of record October 10, and a dividend of 68 cents a share on the common stock, payable October 1 to holders of record September 12.

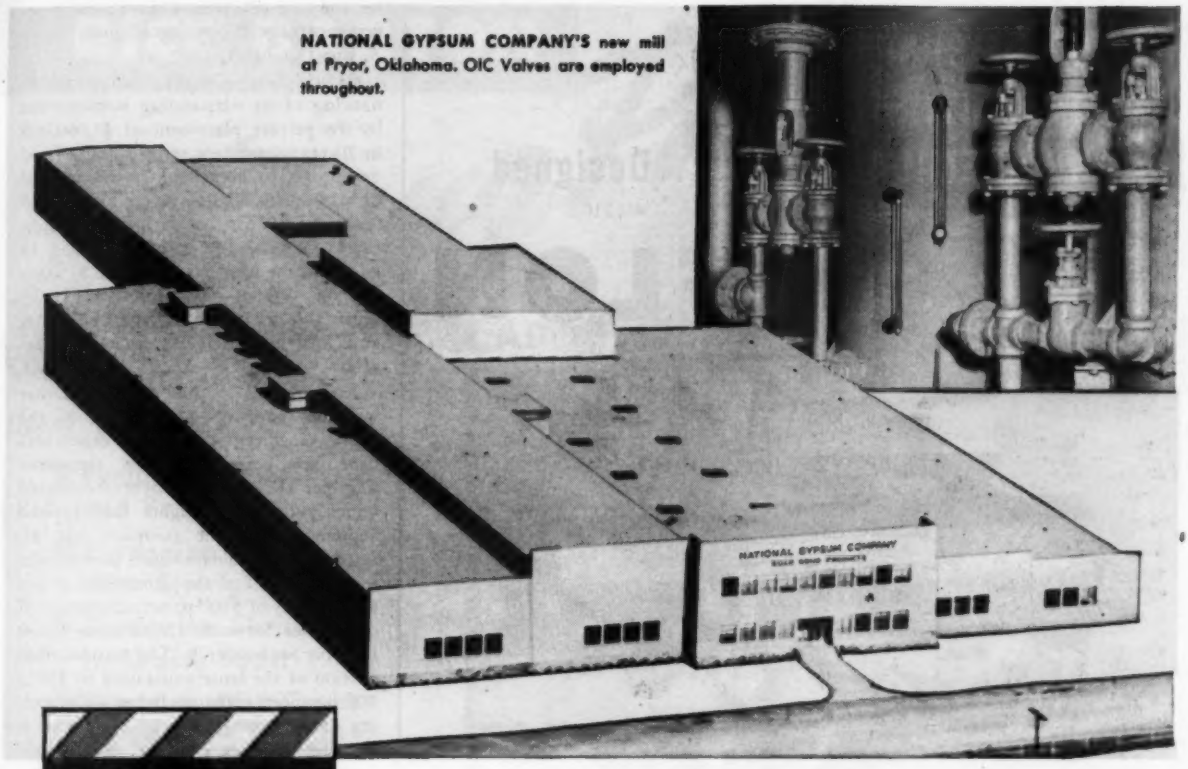
The Mead Corp. has declared a regular quarterly dividend of 40 cents on the common stock and a stock dividend of one common share for every 50 held on record November 3, both payable December 1.

Minnesota & Ontario Paper Co. has declared a quarterly dividend of 50 cents per share on the common, payable October 15 to record of October 3.

Paper mill corporate changes

Crown Zellerbach Corp. has completed a program for financing its converting operations by selling its Los Angeles converting plant and office building to the Mutual Life Insurance Co. and then leasing the property for 25 years with the privilege of renewal for another 50 years. This follows similar arrangements for two other plants in the Los Angeles area, in addition to buildings in Sacramento, San Leandro, Seattle, and Salt Lake City.

Ketchikan Pulp Co.'s construction of a dissolving pulp mill at Ward Cove has been financed through Morgan Stanley & Co. and Dillon, Read & Co. The major part of the funds for construction have been obtained through agreements with four institutional investors



NATIONAL GYPSUM COMPANY'S new mill at Pryor, Oklahoma. OIC Valves are employed throughout.

BUILD BETTER WITH
Gold Bond

...just as NATIONAL GYPSUM builds better with OIC VALVES

In line with their policy of placing plants within important market centers, National Gypsum Company has recently added this "push-button paper mill" at Pryor, Oklahoma. Here wastepaper is converted into a bonded eight-layer sheet for lining Gold Bond gypsum board, lath and sheathing.

Also conforming to their policy of using the highest quality products in their construction, OIC Valves were used at this new mill. OIC Valves are *precision engineered* and *precision built.* OIC engineers offer you *precision application* help.

THE OHIO INJECTOR COMPANY, WADSWORTH, OHIO

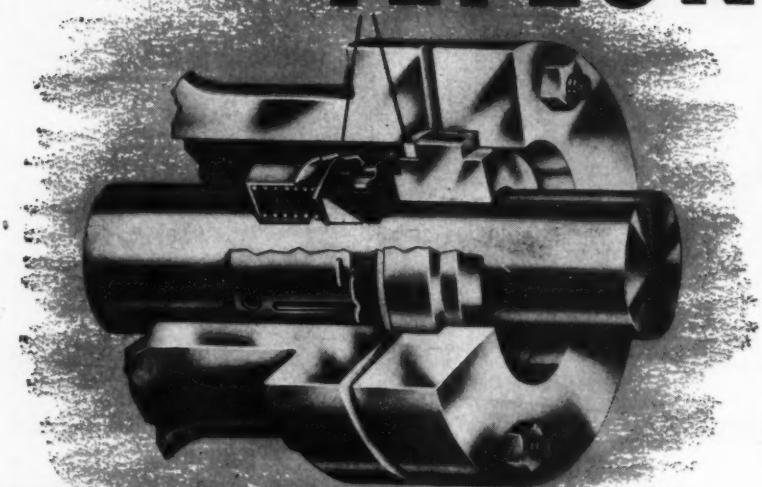
OIC
FOUNDED 1883

THE LONG LINE OF VALVES

VALVES

FORGED AND CAST STEEL • IRON • BRONZE

NOW—A SHAFT SEAL THAT WITHSTANDS ANY CHEMICAL..... Designed WITH TEFLON*



"JOHN CRANE" TYPE 9 Mechanical Seal

Prevents Leakage of:

- EXPENSIVE CHEMICALS
- INFLAMMABLE LIQUIDS
- TOXIC GASES
- CORROSIVE LIQUIDS
- SOLVENTS

This revolutionary seal was developed by Crane Packing Company after two years research and field testing—expressly for use with hard-to-handle chemicals. Its flexible wedge ring and sealing ring are molded from the remarkable new plastic, Teflon, which is not affected under any known corrosive or solvent service.

John Crane engineers thus put the unique properties of Teflon—high heat resistance, extremely low friction and chemical inertness—to practical use in the Type 9 Seal. Result: a new, efficient way to handle corrosive liquids and gases that never before could be effectively controlled by conventional, flexible-type mechanical seals. It can be employed at temperatures up to 500°F.

The Type 9 Seal gives consistently dependable service on all rotating shaft applications, such as centrifugal pumps, turbines, speed reducers, positive displacement pumps and agitators.

Other John Crane Teflon Products include expansion joints, C-V Rings, packings and gaskets. Also, parts molded or machined to your particular requirements.

Write Dept. PI-11 today for new booklet describing the John Crane Type 9 Shaft Seal

*DuPont Trade-mark for tetrafluoroethylene resin

JOHN CRANE — CRANE PACKING COMPANY
1807 CUYLER AVE • CHICAGO 13, ILLINOIS
Offices in All Principal Cities in United States and Canada

for the sale of up to $36,000,000 in its first mortgage 4½ per cent bonds, Series A, due October 1, 1972.

Oxford Paper Co. has arranged the financing of its outstanding indebtedness by the private placement of $7,000,000 in 20-year 4 per cent serial sinking fund debentures to be repaid at the rate of $250,000 each six months, in addition to an agreement for the placing of an additional $3,000,000 by October 1, 1954. In addition, the firm has borrowed $2,000,000 on 3½ per cent bank notes to be repaid with $500,000 October 1, 1954, and $250,000 each six months thereafter.

Scott Paper Co. has announced that warrants covering $24,407,000 of the firm's 3 per cent convertible debentures have been exercised. This represents 97.8 per cent of the debentures offered under subscription rights that expired September 23. The company has offered its shareholders rights to subscribe to $24,952,800 of the debentures at par on the basis of $100 principal amount of debentures for each 12 common shares held on September 8. The unsubscribed portion of the issue amounting to $545,800 has been taken up by an underwriting group managed jointly by Drexel & Co., Smith, Barney & Co., and Merrill Lynch, Pierce, Fenner & Beane.

Union Bag & Paper Co. has offered its bag factory at Hudson Falls, N.Y., for sale, but will continue operations until a deal is concluded.

New York Stock Exchange—Stocks

	Closing Prices Oct. 20, 1952	Sept. 19, 1952
A.P.W. Products	4⅞	4⅞
Celotex	15⅝	17⅛
Same Preferred	• 16⅛–16½	16⅛
Certain-teed Products	13⅜	14⅛
Champion P&F Co.	28¼	27¼
Same Preferred	105	103¾
Chesapeake Corp.	30	30⅝
Continental Diamond	11⅛	11⅝
Container Corp.	38½	35⅝
Same Preferred	•102–104	100½
Crown Zellerbach	55	55⅝
Same Preferred	102⅛	102⅛
Dixie Cup	33	32½
Eastern Corp.	• 17–17⅛	17⅛
Robert Gair	17⅛	16⅝
Gaylord Container	• 26½–26⅝	27⅞
International Paper	49⅝	49⅞
Same Preferred	102¼	102
Kimberly-Clark	46½	47⅞
MacAndrews & Forbes	40¼	41
Marathon	24	24⅝
Masonite	23¾	24½
Mead Corp.	24⅛	24½
Same Preferred	• 87–88¼	86¼
National Container	11¾	10⅝
Rayonier, Inc.	32⅝	33¼
Same Preferred	35½	35⅝
Scott Paper	51⅞	52⅜
Same $3.40 Preferred	• 87½–89	90½
Same $4 Preferred	103	105
St. Regis	19¼	19
Same Preferred	• 92–93½	93
Sutherland Paper	25⅝	25⅞
Same Preferred	108	106¼
Union Bag & Paper	44¼	47⅛
United Board and Carton	• 13¾–13⅝	13⅝
United Wall Paper	3	2⅝
Same Preferred	25	24⅛
U.S. Gypsum	113½	115½
Same Preferred	•173–174	174½
West Virginia P&P Co.	• 73⅜–75	77
Same Preferred	•108⅛–109½	108

New York Stock Exchange—Bonds

Celotex 3½%	99¼	99¼
Champion P & F Co. 3%	—	—
Mead Corp. 3%	—	—

New York Curb Exchange—Stocks

Am. Writing	3⅝	3½
Brown Co.	3⅛	3⅛
Brown Co. $5 Preferred	98¾	103
Same Preferred $3	—	49
Great Northern Paper	51	52
Hammermill	—	—
Puget Sound	28	28½

*Closing Bid and Asked Prices

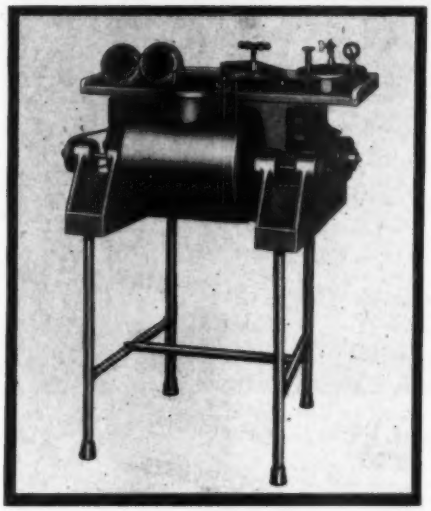
RICE BARTON

DynoPulpers

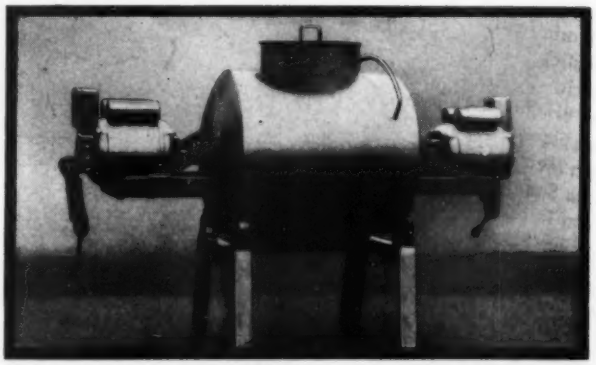
LABORATORY and PILOT MODELS

With them you can:

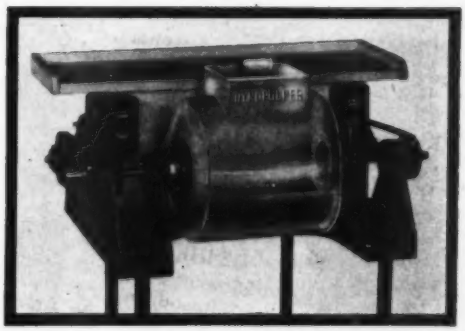
- **Evaluate Waste Paper and Pulp**
- **Recognize Wet Strength**
- **Determine Shrinkage in Waste Paper**
- **Establish Dirt Count on Pulp**
- **Match Colors (two minutes)**
- **Test Mixtures of Stock**



Model 3SP
Laboratory DynoPulper with Stainless Steel Vat. Can be used under pressure. Also available without pressure cover. Capacity 500 grams at 4% consistency.



Model 18
Pilot Model DynoPulper. Available in Carbon Steel or Stainless Steel Vat. Capacity 10 lbs. at 4% consistency.



Model 3
Laboratory DynoPulper with Plexiglass Vat. Capacity 500 grams at 4% consistency.

The DynoPeller

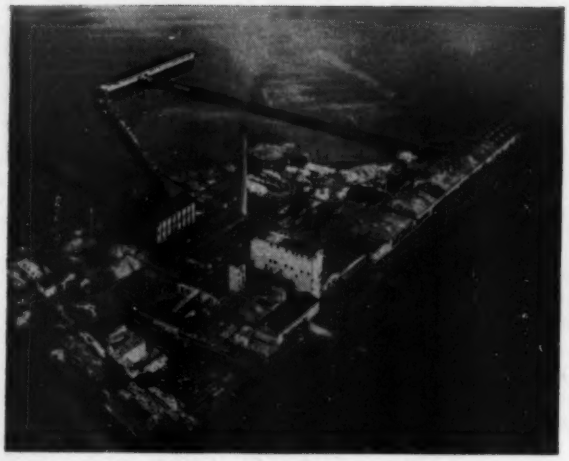
is the heart of all DynoMachines. Its concave face is lined with rough, hard carbide particles. As the DynoPeller rotates it causes a suction at its center that pulls the stock toward it. Centrifugal force then causes the stock to flow rapidly over the rough carbide particles under a gentle hydraulic pressure. This effective dynomizing action completely disintegrates the stock . . . separating each fiber from its neighbor while maintaining its original length.

These models available on a lease basis ($50.00 per month). Any charges will be deductible from the purchase price of a new lab model or a commercial machine.

RICE BARTON Research Corporation
WORCESTER 1, MASS.

PAPER...*one of 187 industries served by General Chemical*

News of the Industry



VIEW of Fibreboard Products Port Angeles division

SINGLE FACE end of 85-inch Langston corrugator

Fibreboard Products Modernizes and Expands Washington Plants

AS PART OF A long-range program of improvement and modernization at its plants in Port Angeles and Sumner, Wash., Fibreboard Products Inc. has undertaken major projects in connection with converting, mill stock refining, power production, and other operations.

Heading the list of improvements at the Sumner mill is the new steel and concrete iron-sided converting plant of 34,500 square feet, which was built to house additional corrugating equipment, including stitching, taping, slotting and printing machinery. Production executives have estimated that this will eventually increase output by approximately 300 per cent.

In addition to the new equipment, 100 per cent modernization of the mill stock refining equipment has also been accomplished at Sumner. This includes the installation of a 10-foot diameter Shartle batch Hydrapulper, an Emerson Jr. No. 3 refiner, and an Emerson magnetic separator. In addition, a new Emerson Jr. refiner was installed on the liner system, eliminating the necessity for batch feeders and resulting in more effective stock preparation, as well as increased production and better quality.

Converting improvements

Equipment in the new converting plant includes an 85-inch Langston corrugator with A-B flute single facers and a double cut-off having a continuous running feature that materially increases production by saving time on sheet size and order changes.

Another feature of the new Sumner installation—and said to be one of the most unique and modern to be found in any paperboard mill—is the improvement in the corrugating and printer-slotter trim handling. This is accomplished through the use of conveyors and blowers, which return the waste trim directly to the board mill pulping system.

The increased power load requirements are provided by a new steam boiler and other additions to the power plant.

Port Angeles improvements

At the Port Angeles plant additional stock preparation equipment and modernization consist of a Downingtown Hydrapulper and a Morden stock refiner. This equipment adds materially to the versatility of the products that can be produced, since it utilizes waste grades of paper formerly difficult to handle. It also enhances stock refining and stock preparation capacity and efficiency.

The No. 1 paperboard machine has been completely modernized by the installation of a Downingtown suction drum roll, one additional Black-Clawson vat, a General Electric turbine drive, new Black-Clawson drive-in stands (one of which is equipped with reversible gear), 18 new 42-inch diameter 150-pound Downingtown pressure dryers, plus Mid-

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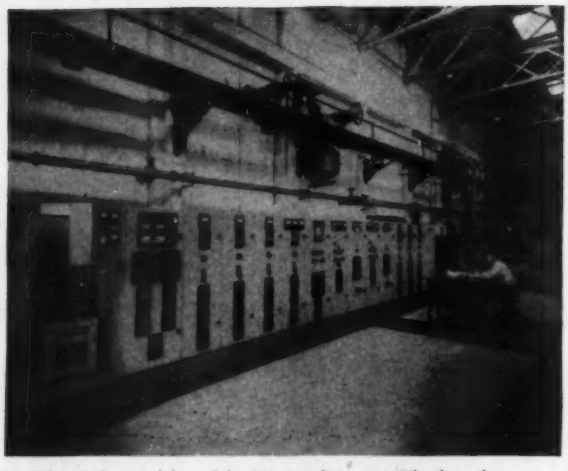
G-E MECHANICAL driven steam turbine at Port Angeles



MAIN switch panel board by Westinghouse at Fibreboard

west-Fulton dryer steam control system, and a J. O. Ross hot-air system. A protective hood is to be added to the board machine.

The effect of these installations will be to increase output by 3,600 tons per year, together with a substantial increase in quality and in the number of types of grades that can be produced.

Scott's Soundview Div. Installs Wet End Drives

Scott Paper Co.'s Soundview Division at Everett, Wash., has recently installed Black-Clawson drives on the wet ends of its Nos. 1 and 2 pulp drying machines. Four of the spiral-bevel gear drives were put into operation on the No. 1 machine—at the couch, first, second and third presses. Four were installed at the same positions on No. 2 machine.

The drives were furnished with drive-in shafts and flexible couplings. Each is equipped with a Fawick Airflex clutch to provide for control of the drive from the front side of the machine.

The Soundview Division, a recent addition to the Scott family of mills across the country, employs about 525 persons, maintains its own woodlands, and produces more than 600 daily tons of bleached sulphite pulp, which is converted into high-grade tissue and paper products at other company mills.

St. Regis to Construct Plant in Rhode Island

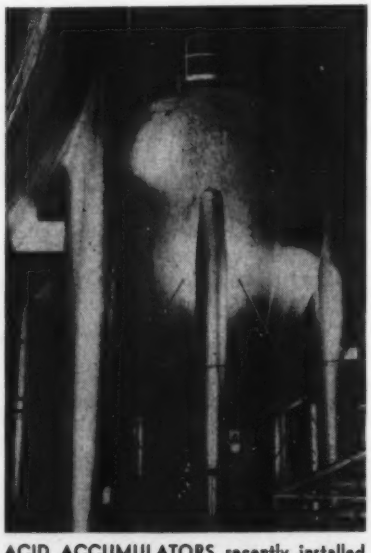
St. Regis Paper Co. has reported the selection of a 15-acre property in East Providence, R.I., as the site of the new plant to be constructed for the Engineering and Machine Division. The new operation, replacing one presently occupied at Oswego, N.Y., is expected to be ready for occupancy by the middle of next year. (Under terms of the agreement by which St. Regis sold its properties at Oswego to Marathon Corp. in April 1951, delivery of the machine shop was not to take place until July 1, 1953.)

The Engineering and Machine Division designs and builds a wide range of valve and open-mouth multiwall bag filling equipment and scales and, in addition, manufactures bag making machines. It also maintains a staff of specialists for research and design of new equipment, for experimental development and testing.

Construction of the new facilities, which will provide 100,000 square feet of space and cost $1,500,000, was to be started in October. The brick structure will provide for a fully equipped machine shop on the ground floor and engineering and general offices on the second floor. In addition, provision will be made for a testing laboratory and experimental laboratory.

Negotiations were concluded recently for the construction of the plant, which is to be occupied by St. Regis under a long-term lease with Pembroke Corp. Peter B. Ruffin, executive vice president of John W. Galbreath & Co. Inc., handled the negotiations for Pembroke. The financing of the transaction was done with the Equitable Life Assurance Society of the United States.

Plans and drawings for the building were done by Alexander D. Crossett & Associates, architects and engineers of New York, N.Y., while Turner Construction Co., also of New York, has been assigned the actual construction.



ACID ACCUMULATORS recently installed at Groveton Paper Co. in Groveton, N. H.; the 28- and 24-foot diameter Hortonspheres, built by Chicago Bridge & Iron Co., are designed to operate at 75 psi working pressure

Bowater Consolidates Three Subsidiaries

The common stock of three firms has been purchased by Bowater Corp. of North America Ltd., new wholly owned subsidiary of Bowater Paper Corp. Ltd. of London. The companies involved in the transaction are Bowater's Newfoundland Pulp & Paper Mills Ltd.; Bowater Paper Co. Inc., New York, N.Y., (which sells Bowater products in North America), and Bowater's Southern Paper Corp. The latter is constructing newsprint and sulphate pulp mills in eastern Tennessee.

Sir Eric V. Bowater, chairman and president of parent Bowater Paper, has announced that the new corporation is issuing to the parent firm 4,367,732 shares of declared value of $23,372,245 in payment for the subsidiaries.

The Bowater organization specializes in newsprint, but also manufactures magazine, book, roll-coated, and kraft papers; building board; sacks and cartons, fiber drums, and bag linings. According to a spokesman for the company, present expansion plans should boost annual capacity to more than 1,000,000 tons of paper and 250,000 tons of market pulp. About 50 per cent of the paper and 40 per cent of the pulp would be made in North America.

Hoberg Paper Mills Buys Little Rapids Division

Hoberg Paper Mills, Green Bay, Wis., has announced the purchase of the pulp division of Little Rapids Pulp Co. at DePere. The amount involved in the transaction, which took place October 1, was not disclosed. The Little Rapids firm, headed by Charles N. Egan, president and treasurer, will continue its other branch of operations at Shawano Paper Mills.

According to Mr. Egan, the sale of the pulp division will in no way affect the Shawano papermaking operation because of other sources of raw materials. He indicated that the firm will probably install pulp making equipment at Shawano in the near future.

J. M. Conway, president and general manager of Hoberg, explained that for a number of years his firm has been purchasing nearly the entire output of Little Rapids—700 tons of groundwood pulp per month. Thus, the purchase of the plant guarantees Hoberg control of its raw material supply.

No change in the personnel or management at Little Rapids is contemplated. Resident manager of the firm is Robert Leaf Jr. Supervising the organization of approximately 30 employees is James Miller. The plant is to be operated as a separate unit and will be designated as the Little Rapids Pulp Division of Hoberg.

The Little Rapids mill produces groundwood pulp exclusively. The facilities consist principally of a bleach plant and seven grinders (see THE PAPER INDUSTRY for August, page 596). Water power is used extensively. Other equipment includes trucks, tractors, buildings, and seven dwellings. The plant has been in existence since 1912. Mr. Egan and members of the corporation took control in 1947. During that period of ownership a new process for bleaching pulp was developed.

Expansion Notes

Marinette Paper Co.,
Marinette, Mich., has reported a temporary halt in the construction of its new converting plant due to the government-imposed civilian steel freeze. Other phases of the construction, such as work on the parking lot, relocating the highway, and moving power and telephone lines, is underway.

Pilot Rock Lumber Co.,
plans to build a $5,000,000 wood fiber plant at Pilot Rock, Ore., to be known as Oregon Fibre Products Inc. The new firm is to produce both soft and hardboard products, including acoustical tiles, sheathing and roof insulation. Rated capacity of the projected plant is to be 300,000 square feet daily.

CONSTRUCTION WORK on the new pipeline being installed by Weyerhaeuser Timber Co. at its new kraft pulp mill in Everett, Wash.

Weyerhaeuser Installs Six-Mile Pipeline

A six-mile pipeline to supply 30,000,000 gallons of water daily to Weyerhaeuser Timber Co.'s new kraft pulp mill at Everett, Wash., is now under construction. The installation is to be completed by July of next year.

The pipeline is constructed of 40-inch steel and concrete pipe and will tap fresh water from the nearby Snohomish River. The city of Everett is unable to supply water to the new plant. Daniel G. O'Shea, project engineer, reported that the pumps will be located at the headworks and will be wholly automatic and operated by remote control. Water used by the plant will be treated in concrete settling tanks before being introduced to the pulping process.

When the mill is completed it will produce 250 tons of bleached kraft pulp per day. The operation is to be supplied with fir chips from two large Weyerhaeuser sawmills nearby, as well as from the Snoqualmie Falls and White River mills. The pipeline is being built under subcontract by C. J. Montag & Sons of Portland, Ore., to the general contractor, L. H. Hoffman, also of Portland.

Gaylord Container Corp.
is planning to begin construction on a new corrugated and solid fiber box plant in St. Louis. Exact cost of the plant was not disclosed. The first unit, which will cover 260,000 square feet, will house activities now carried on at two other St. Louis plants.

Sonoco Products Co.
of Hartsville, S.C., has acquired Gates Paper Co., Los Angeles. E. H. Southwell, former Gates president, will remain as Sonoco's manager for the western plant and is also to be in charge of sales for the Western Division. Gates, established in 1928, produces spiral paper tubes, paper cans, fiber cans, with metal ends, containers, and other paper products for the packaging industry and paper specialties.

Cleveland Container Co.
will open a second plant in Memphis, Tenn., about January 1. The new plant will cost about $150,000 and will contain 35,000 square feet of floor space. Two hundred persons will be employed.

Certain-teed Products Corp.
has completed a new engineering and research center at Paoli, Pa. The $400,000 structure will house all product development and testing and plant engineering.

Construction
is well underway on the 300-ton pulp mill being built at Ketchikan, Alaska, by Puget Sound Pulp & Timber Co. and American Viscose Corp. Production is expected in 1954.

Behr-Manning Corp.
has started a new phase of its expansion program following the announcement of the completion of a new home for its waterproof sandpaper manufacturing operations. The Watervliet, N.Y., firm disclosed that the construction time table

for the building, which will add 100,000 square feet to the firm's manufacturing space, calls for occupancy by the fall of 1953.

Pulpwood. Growth
and a pulp mill are being sought for southeastern Kentucky by the Harlan County Chamber of Commerce. Growing pulpwood would utilize thousands of now non-productive mountainous areas.

Mando Inaugurates Psychological Aptitude Testing Program

Remote control pyschological aptitude testing of screened applicants for sales positions is now being successfully used by the Insulite Division of Minnesota & Ontario Paper Co., Minneapolis.

For the past several years the firm's use of such testing, while serving as a valuable aid in the selection of sales trainees, has been limited to those applicants who could appear personally in the Minneapolis office. In 1950 a technique was developed for selecting applicants all over the country to take the battery of tests locally under the guidance of one of the division's field supervisors. These field-administered tests, along with the supervisor's own rating of the applicant, are mailed to the main office for processing.

Field testing of sales applicants is an outgrowth of a comprehensive selection and training program undertaken at Insulite in 1944 to provide the additional well qualified and trained sales representatives needed in the organization.

Aptitude tests of sales applicants, tried at first on an experimental basis, have proved successful. Before embarking on the testing program, however, careful study was given and continues to be given to the creation of the "profile" typical of a successful Insulite sales representative. It was found that the ideal must be a composite territory manager, business consultant, salesman, technical adviser and good-will ambassador.

The remote control method has now been successfully used for two years. Application forms, tests and interview forms are sent to field supervisors, who conduct the interviews and give the applicants the battery of tests. The interview and application forms, together with the completed tests, are returned to Minneapolis, where the industrial psychologist scores and interprets the results. The results are reviewed by the personnel department and recommendations made to the sales staff, where the final decision is made.

Wisconsin Conservation Body Urges Tax Cut as Pollution Aid

THE WISCONSIN Natural Resources Committee has moved to grant tax concessions to those who follow conservation practices in industry. The group approved a proposed bill giving tax privileges to industries for money spent eliminating water pollution.

The bill would give firms a chance to amortize for income tax purposes money spent to clean up pollution and provide that property used to eliminate pollution of streams be exempt from real and personal property taxes for a limited time.

The resources committee, which was created by the 1951 legislature, voted to submit the bill to the legislative council. It was recommended earlier by the council's subcommittee on taxation and has the backing of paper manufacturers, canners, and the Izaak Walton League.

Success Indicated in Roadbinder Experiment

A newly developed use for spent sulphite liquor that may importantly cut the costs of maintaining blacktop roads is being tested in Wisconsin. If it proves successful under long-term service, it will help reduce the sulphite pollution of the state's streams by using up substantial quantities of the industry byproduct that otherwise is flowed into waterways.

The new process was first discovered by an Ashland County supervisor about a year ago. It was promptly referred to the Sulphite Pulp Manufacturers' Research League at Appleton for further study. The problem was put up to the League's chemists and to the University of Wyoming's highway engineering laboratory. The results achieved by practical road men have now been verified by these experiments.

Test stretches

Several test stretches of worn out blacktop road have been given the sulphite treatment during the past summer in the Ashland and Price county areas, the most recent a two-mile road completed in early October near Mellen. A number of streets in Green Bay were thus rebuilt by the city engineer, and a one-mile road near Wayside in Brown county was similarly treated—with spectacular improvement. A street in Park Falls that was "so far gone" that League experts considered it hopeless is now standing up smoothly to heavy traffic.

A special roadbinder committee has been set up by the Research League to check results and develop satisfactory methods for use of this sulphite mill byproduct. Members include Walter A. Sherman, assistant manager of the Flambeau Paper Co. mill at Park Falls; Clyde Faulkender, technical director of Hoberg Paper Mills, Green Bay, and G. K. Dickerman (chairman), technical director of Consolidated Water Power & Paper Co., Wisconsin Rapids.

Lagoon System Being Built by Nekoosa-Edwards

Spent sulphite liquor previously flowing into the Wisconsin River will be pumped into ponds or lagoons that are now being constructed by Nekoosa-Edwards Paper Co. at Port Edwards, Wis., under the supervision of state officials. Design and specific area for testing were chosen in consultation at the site between company engineers and personnel of the State Committee on Water Pollution headed by Theodore F. Wisniewski, state pollution commissioner.

Public officials and the mill's technical men recognize that this is an experiment, but they are hopeful it will yield valuable data. Preliminary tests using smaller ponds indicate that this disposal process may improve stream conditions.

Nekoosa-Edwards has built on an island 2,000 feet from its sulphite pulp mill a lagoon system that consists of two 2,000-square foot primary receiving pits and a 4,000-square foot secondary pit, all three pits 4 feet deep and interconnected so that any combination of these may be used at any time. Other parts of the project are a collection system to gather spent liquor from blowpits, two 70,000-gallon wood stave storage tanks, a pump capable of delivering 140 gallons per minute, and 2,000 linear feet of 4-inch welded stainless steel pipe with accompanying valves and fittings.

Preliminary experiments with smaller lagoons showed that spent sulphite liquor soaks into the sandy soil of the island at a rate between 20 and 30 gallons per square foot per hour. Daily tests will be made on river water at several sampling stations to detect any seepage of spent sulphite liquor that may occur, and to measure improvement in stream conditions resulting from this installation.

Pollution Notes

Adapting Modern Road Machinery
for use with sulphite roadbinder was the subject of a series of tests undertaken October 8 at Oconto Falls, Wis. More than 80 street and road builders, public

VACUUM PICK-UP ARRANGEMENTS

Engineered to meet your needs...

Following the first installation several years ago on a machine manufacturing light and medium weight Kraft papers, the use of the so-called "vacuum pick-up and transfer" has grown by leaps and bounds until today many installations have been made and many more are under construction for operation on newsprint, waxing, and other grades.

The automatic handling of the sheet from the wire to the press felt, instead of the conventional handling methods, permits safe machine operation at considerably higher speeds with a resulting increased production.

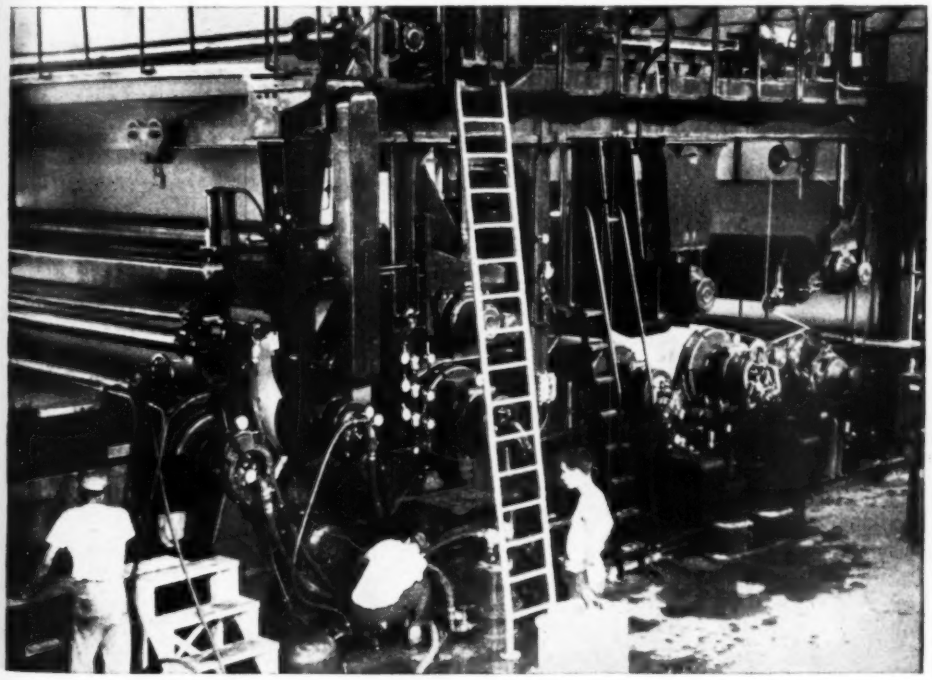
In the case of newsprint, the quantity of chemical pulp content may be reduced substantially.

Puseyjones have built and supplied this arrangement for two new machines and have one under construction for an existing machine.

As with all new ideas, refinements and changes have been made since the original installation. As a result, several arrangements may be used depending upon space limitations, product requirements and other considerations.

Whether you are interested in this equipment for a new machine or modernizing present equipment, Puseyjones engineers are at your service.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products.
Wilmington 99, Delaware, U. S. A.



Illustrated at left is actual installation of Vacuum Pick-Up Arrangement on 236" Machine.

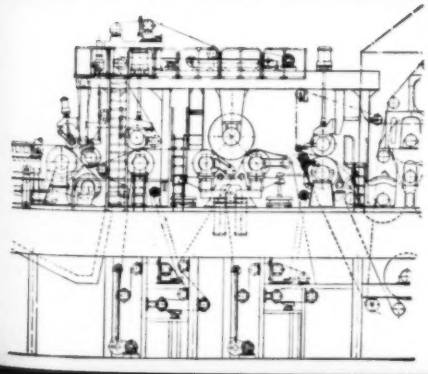
Line drawings (left to right) show:

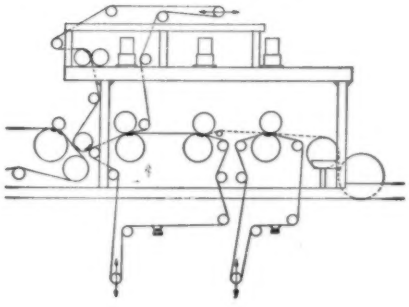
Original arrangement with Transfer Press and combination 3-Roll Main Presses (Cloverleaf).

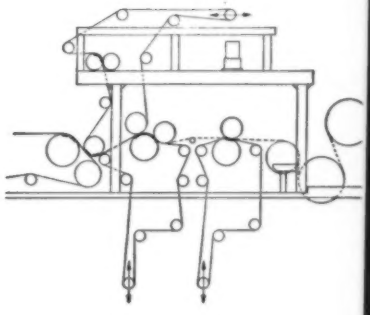
Modified arrangement with Transfer Press and conventional Main Presses.

Modified arrangement with combination Transfer and Main Press (Multipress) and conventional Second Press. Minimum space required.

THE SIGN OF TRADE MARK SUPERIOR QUALITY







Losing Soda to the Sewer via Foam?

Stop this loss with an

IMPCO FOAM BREAKER

The Mechanical Foam Breaker separates liquor centrifugally for recovery and delivers clean air to the atmosphere. It permits the use of smaller liquor and foam tanks. No longer is foam a problem and only IMPCO can offer you a true counter current washing system which is completely closed.

IMPROVED PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

SHERBROOKE MACHINERIES LIMITED Sherbrooke, Quebec manufacture similar equipment in Canada

S—17

officials, and sulphite pulp engineers took part. The tests were under the auspices of Falls Paper & Power Co. Road machinery was provided by Stone Mfg. Co., Milwaukee distributor. Results of the experiment will be known after extensive checking.

Consolidated Water Power & Paper Co.'s Interlake Mill at Appleton, Wis., has installed a huge storage tank as a step toward using spent sulphite liquor as industrial fuel instead of flowing it into the Fox River. The 14,000-gallon stainless steel unit was fabricated at Marshfield. It will be used for storing sulphite liquor that has been concentrated to about six times its original strength.

Subscribers to Maine Foundation Announced

Eight new subscribers to the University of Maine Pulp and Paper Foundation at Orono have been announced by John B. Calkin, secretary. The Foundation, established in 1950, is designed to interest students in entering the pulp and paper and allied industries, to provide scholarships, to step up research, to increase teaching facilities and personnel, and to make available well-trained men to the industry.

Company scholarship underwriters named by Professor Calkin were Scott Paper Co. and the National Association of Waste Material Dealers Inc. (Waste Paper Institute). Company members include Eastern Corp., Improved Paper Machinery Corp., and Samuel M. Langston Co. Special gifts have been received from Cameron Machine Co., Dennison Mfg. Co., and Niagara Alkali Co.

Macon Kraft Employees Achieve Better Business Understanding from Conference

A better understanding of the nation's economy has resulted from a conference on the American business system presented recently by Macon Kraft Co. for its employees in Macon, Ga. The conference resulted from the great amount of interest shown by hourly rated employees in a series of conferences for management personnel about the American economy.

Some 97 per cent of the employees who answered a questionnaire about the project said they had definitely benefited. Three-fourths of the group reported they had a "much better understanding." Attending the two-hour meeting on company time were 522 employees.

The employee conference was a condensation of the material presented to the members of management. A special 37-page textbook was written to supplement it, and a copy was presented to each employee.

FIVE STUDENTS in the pulp and paper technology curriculum at Western Michigan College, Kalamazoo, recently received from John L. Richey, executive secretary and treasurer of the Paper and Twine Association, three $200 scholarships and two $150 awards in the name of the association; assisting at the program was R. C. Germanson, research director at Kalamazoo Vegetable Parchment Co. and chairman of the scholarship committee; pictured are (seated, l to r) William Fondow of Appleton, Wis.; Leonard Timmer of Kalamazoo, and John Grice of Mt. Pleasant, Mich.; those standing are James Clarke of Wilmette, Ill.; Maurice Metzelaars of Constantine, Mich.; Mr. Germanson and Mr. Richey

Newsprint Mill Reported Planned for Cincinnati Area

IT WAS DISCLOSED in Cincinnati October 10 that a local newsprint mill that could supply the combined needs of newspapers in the Cincinnati-Dayton-Columbus area at prices lower than that asked by Canadian sources is in the planning stage. According to a report, a building site or a plant now standing will be purchased between Cincinnati and Dayton.

It is expected that 100 tons per day will be rolling from the mill by late 1953. The plant would have a full production capacity of 200 tons daily, which is the consumption of newspapers in the three-city area. Newspapers will be reclaimed by a bleaching process and reprocessing method followed in other sections of the country. To employ between 350 and 400 workers, the plant is expected to cost $6,500,000 if built from the ground up, or considerably less if a going plant is purchased and converted. It would be incorporated as United News Print Mills.

Use of Bagasse for Newsprint "Feasible"

Newsprint can be produced from bagasse—a sugar cane waste—to help relieve the newsprint shortage in the United States, it was announced recently by the U. S. Department of Commerce in Washington, D. C. The announcement was made in a report to the judiciary committee of the House, which has been investigating production.

The report incorporated results of tests made by the National Bureau of Standards and other government agencies with the cooperation of newsprint producers and publishers. The tests were made on the House committee's request for an investigation of new raw materials and technical processes in the manufacture of newsprint. (Bagasse is the residue remaining after juice is squeezed from sugar cane.)

"It has been clearly demonstrated that we can manufacture from whole bagasse a paper satisfactory in all important respects and superior in some to newsprint now currently in use," Commerce Secretary Sawyer told the committee in a letter. "It is also indicated that the total costs of manufacturing newsprint from bagasse are at least as low—and in my opinion probably will be eventually much lower—than production costs of newsprint now used. It is also clear that bagasse could be used economically as a blend with other pulp in the manufacture of standard newsprint and, because of its superior strength and other characteristics, may be suitable for the production of higher grade paper. . . .

"You are well aware and many members of the public are also well aware of the problems faced by American newspapers in connection with newsprint. A goal of 494,000 tons additional capacity was set on January 1, 1951. Capacity expansion to date has fallen

about one-fourth short of that objective.

Shortages of timber

"We are also faced with continuing shortages of suitable timber. The supply of bagasse is ample to take care of all our increased newsprint needs. Louisiana and Florida are substantial sugar cane producers. Great quantities are available in Hawaii and Puerto Rico and even greater quantities in Cuba and the rest of the Caribbean area.

"World production of bagasse is about twenty-five million tons a year, of which the United States and its territories and Central America account for one-half. If only part of this supply is available for newsprint, potentialities are impressive."

In the investigation conducted by the National Bureau of Standards the bagasse newsprint was subjected to every known test for comparison with standard newsprint made from wood pulp. The bagasse newsprint was produced in a pilot plant of the bureau, and the Government Printing Office ran off a sample issue of the Congressional Record on the new paper.

Two Newsprint Mills Sold Out for 15 Years

Sir Eric Bowater has announced that the entire newsprint and pulp production of Bowater's mills in Corner Brook, Nfld., and in eastern Tennessee have been sold out for the next 15 years. He added that he believes that Bowater Paper Corp. is the only paper manufacturer in the world that can boast such advance orders.

The production potential at the Tennessee mill is 130,000 tons of newsprint and 50,000 tons of sulfate pulp per year. Contracts held by the Newfoundland operation in southern United States have been transferred to the Tennessee mill to save shipping costs. New northern contracts have been assigned to Corner Brook production.

September Newsprint Output in N. A. Breaks Record

Production of newsprint in Canada (including Newfoundland) during September amounted to 461,508 tons and shipments to 462,404 tons. Output in the United States was 92,301 tons, while shipments were 90,645 tons, making a total North American production of 553,809 tons and shipments of 553,049 tons, as compared with continental production of 521,810 tons and shipments of 520,225 tons in September of last year. These figures were released by the Newsprint Service Bureau. North American output in September exceeded that of any September on record.

The Canadian mills produced 140,663 tons more in the first nine months of this year than in the corresponding period of 1951, an increase of 3.4 per cent. The output in the United States was 36,420 tons, or 4.4 per cent, greater than that in the first nine months of last year, making a total continental increase of 177,083 tons, or 3.6 per cent more than in the comparable period last year.

Stocks of newsprint at the end of September were 141,119 tons at Canadian mills and 9,306 tons at U.S. mills, making a combined total of 150,425 tons, compared with 149,665 tons on August 31, 1952, and 160,733 tons at the end of September 1951.

USE OF NUCLEAR energy to control the amount of carbon applied on carbon paper has been announced by Standard Register Co. of Dayton, Ohio; Fred Liston, supervisor of the carbon department, points out features of the operation to Raymond Fortune, assistant research director; the AccuRay beta gauge, manufactured by Industrial Nucleonics Corp. of Columbus, beams invisible beta rays through the carbon paper and records the amount of carbon applied

Newsprint Notes

Great Northern Paper Co. and Coosa River Newsprint Co. have announced increases in the price of newsprint. Coosa was to increase its price by $5.50 a ton to $125.50 on a mill basis effective November 1. Great Northern was to raise its price, effective October 1, by $7 to $123 a ton.

Reduction in Page Width is being considered by a slim majority of newspaper publishers polled by the American Newspaper Publishers Association in an effort to cut newsprint costs. The present eight-column page used by most papers would be reduced an average of 2 picas.

Newsprint Consumption by daily papers in August was 341,571 tons, a decrease of 0.8 per cent from the 344,470 tons used in August a year ago. Compared with 1950, the August figure was a decline of 1.5 per cent.

Problems of Paper Industry to Highlight January Conference

In recognition of sky-rocketing costs of maintenance in the paper industry and the added engineering and personnel problems due to increasing mechanization, it has been decided to set aside two sessions of the forthcoming Plant Maintenance Conference exclusively to a discussion of paper mills and paper products plants. The conference is to be held at the Public Auditorium in Cleveland January 19-22, concurrently with the Plant Maintenance Show, where thousands of machines and products needed in maintenance will be exhibited.

The sessions devoted to the paper industry will be round table discussions conducted by a chairman and discussion leader. The first session will be at 2 p.m. January 20 and the second at the same hour the next day. Industry leaders from all parts of the country are expected to attend.

In addition to the two sessions devoted exclusively to the paper mills and converters, there will be 64 other meetings dealing with general aspects of plant maintenance. These include such subjects as preventive maintenance, sanitation, lubrication, incentive systems, power plants, pumps and piping, maintenance stores, training workers, maintenance budgets, lighting, work standards, building maintenance, electrical and mechancal equipment maintenance, corrosion control and similar problems.

Kimberly-Clark Surveys Stock Ownership

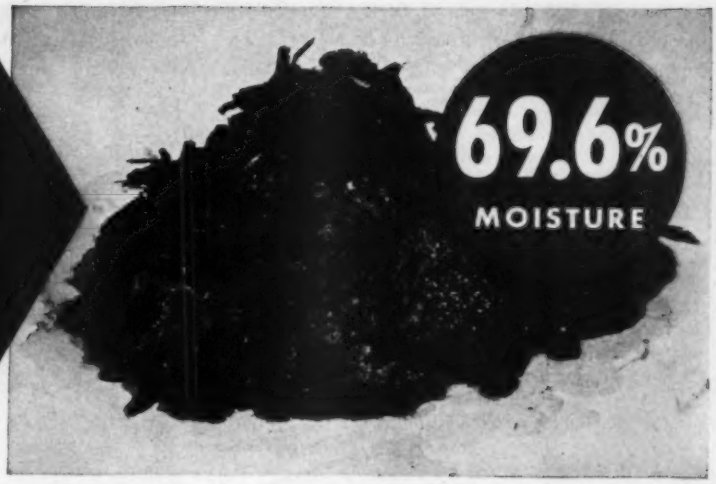
"Who owns Kimberly-Clark?" is answered in the May-June issue of the corporation's employee magazine, *Cooperation*. More than 8,500 owners of common stock, including about 6,700 individuals and 1,800 institutions, trusts or other organizations, were studied in the project.

More than 1,000,000 shares of common stock are held by the 6,700 individual owners, 2,641 of whom live in Wisconsin. The remainder represent every state in the Union, Canada, Venezuela, Honduras, Hawaii, and England.

Cooperation points out that these people have helped provide the money for expansion such as the new mill and machine at Niagara, projects at Memphis, at Niagara Falls, and at Neenah and Kimberly, Wis. Well over half of the common stockholders own less than 100 shares. Some 3,454 individuals and groups own between 100 and 999 shares each, while 222 own more than 999 each. Many of the 222 are banks, trust companies, insurance firms, investment funds and brokers.

Further explaining the financial aspects of paper mill operation, *Coopera-*

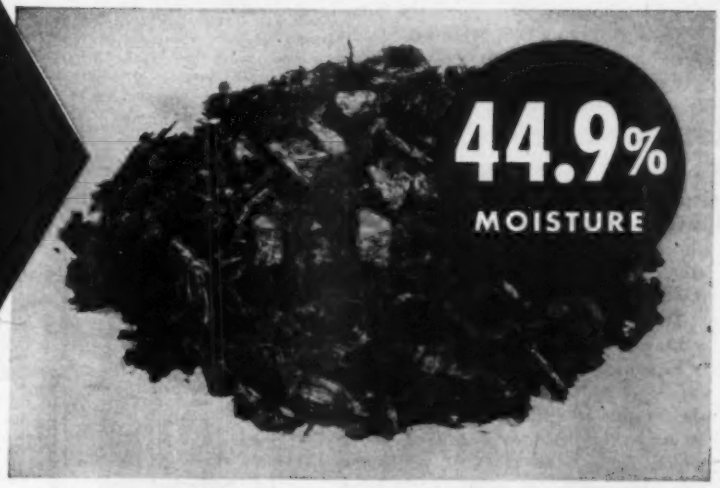
If your knots, bark or other wood refuse look like this:



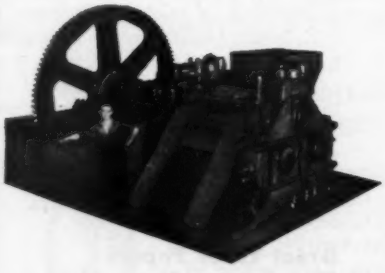
This soggy mass has just come from the digester, soaked in black liquors. Note how cooking failed to reduce knots. *(Both these photos are unretouched.)*

the FULTON ROLL PRESS

Will transform them into profitable form like this:



Here are the same knots after a few moments in the FULTON Roll Press. Note how thoroughly black liquors have been expressed and fibers broken up. *(Moisture percentages are from independent laboratory report on results of test for large Southern Kraft mill.)*



Fast, continuous dewatering-and-reducing eliminates inefficient, costly "Batch" methods!

You'll be simply amazed what a job the FULTON Roll Press does on knots, bark, tailings and other mill waste—and how much *labor, power, handling equipment, time* and *MONEY* it saves!

May We Prove It on Your Material?

Mail Coupon Now!
for full details and
FREE TEST RUN OF MATERIALS YOU WANT TO PROCESS

Fulton Iron Works Company, Dept. 1152
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Please send full details of FULTON ROLL PRESS
☐ We are interested in FREE test run of.....
NAME.....
FIRM.....
ADDRESS.....
CITY.....ZONE.....STATE.....

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tion discusses the more than $3,500,000 contributed by Kimberly-Clark to unemployment compensation reserve funds in three states. The article points out that unemployment insurance legislation, similar to workmen's compensation acts, provides a framework of regulations under which industry itself provides the funds paid to idle employees.

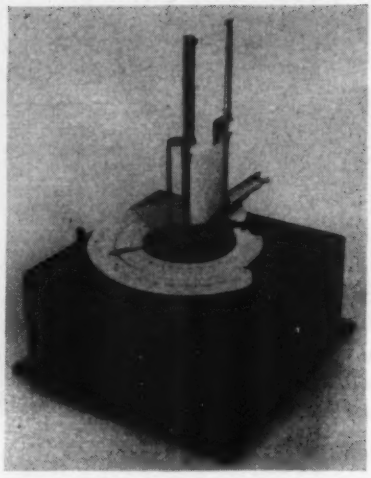
The corporation has paid about $2,000,000 into the Wisconsin reserve funds, about $1,200,000 into the New York State fund, and about $250,000 into the Tennessee fund. (Wisconsin was the first state in the Union to adopt the unemployment insurance program—three years before it became a nationwide system under an act of Congress.)

Paper Stiffness Measured by New NBS Development

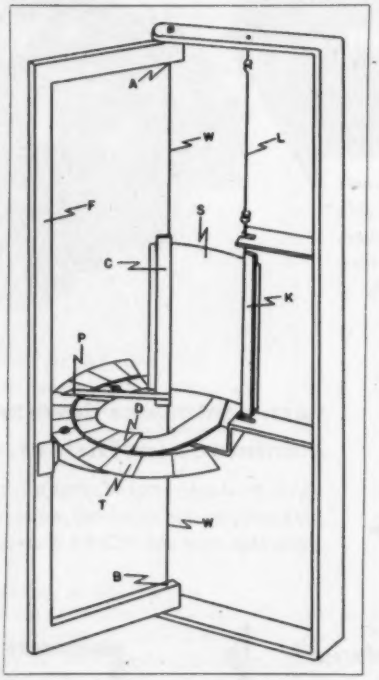
A sensitive instrument that rapidly and conveniently measures the stiffness of commercial papers has been developed by F. T. Carson and Vernon Worthington of the National Bureau of Standards, Washington, D. C. In the new device the specimen is bent through a given angle, and its stiffness is measured by the torque in a wire suspension. By varying the width and length of the specimen and the angle through which it is bent, and by using supporting wires of varying sizes, instruments of this type could be employed to test papers having a wide range of stiffness. It is also expected to prove useful in evaluating the stiffness of thin plastic sheet, textiles, and similar materials.

The NBS device is designed to put a measured twist on the specimen, which is supported in clamps at its two vertical edges. One clamp, through which the torque is applied, is securely attached to the specimen; the other clamp, which applies the reaction, holds the specimen loosely so that it can bend freely and naturally. The first clamp is suspended between two vertical lengths of piano wire, and the outer ends of the wires are fastened to a torque frame. When the torque frame is rotated, the applied torque is transmitted by the piano wires to bend the paper. A pointer attached to the rotating clamp indicates (by its position on a fixed scale) the angle through which the paper is bent, and at the same time shows (on a scale attached to the torque frame) the torque applied to the piano wire.

From the measured values of torque and bending angle and the dimensions of the specimen, the value of stiffness is determined in much the same way as that of a cantilever beam loaded at the free end. However, experimental measurements have shown that the theoretical formula thus obtained must be modified somewhat to take into account the length of the specimen. When this is done, the stiffness (S) is given (for small bending angles) by the equation: $S = ML^n/3b\Theta$, where M is the bending moment at the torque axis, L is the span or bending length (distance between the axes of the two clamps), b is the width of the speciment, Θ is the bending angle, and ^{n} is approximately 0.8.



NBS STIFFNESS TESTER for rapid determination of the stiffness of paper; the left end of the specimen (center) is firmly attached to a clamp suspended between two vertical lengths of piano wire, the outer ends of which are fastened to a torque frame; the clamp at right holds the specimen loosely so that it can bend freely; when the torque frame is rotated by turning the handle at left, the pointer indicates on the inner scale the angle through which the paper has been bent, while the outer scale shows the torque applied to the wire



SCHEMATIC DIAGRAM of the stiffness tester; one end of the specimen (S) is fastened to clamp C, while the other end is held loosely by a similar clamp (K); a bending torque is applied to clamp C through the suspension wires (W) by rotating the frame (F); the applied torque is indicated by the position of the pointer (P) on the scale; (T); the angle through which the clamp C has been rotated is shown by the position of the pointer on the scale D; the pivots of clamp K can move freely in slots in the supporting bracket.

12,000 Ontario Workers Get Wage Increase

An 8-cent per hour wage increase for 12,000 pulp and paper mill workers in Ontario was announced recently in Toronto. The men, employees of 12 firms and members of nine AFL unions, were granted an hourly increase of 4 cents retroactive to May 1, plus another 4 cents effective November 1.

Announcement of the settlement, which also included an increased wage differential for shift work and certain overtime provisions, was made by Eric C. Taylor, chairman of a conciliation board appointed by the provincial government. Representing the employers was Norman Mathews of Toronto. Sen. Arthur RoeBuck, also of Toronto, was the employee representative.

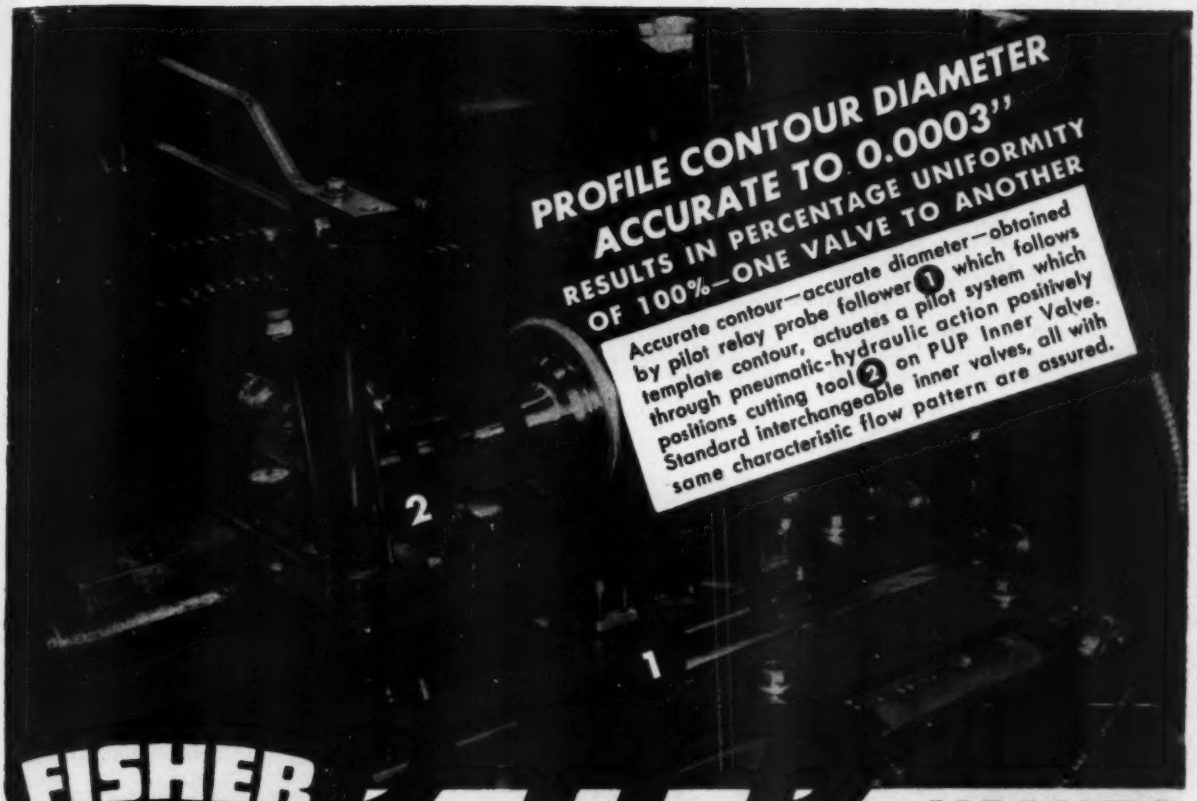
Companies affected include Abitibi Power & Paper Co.; Provincial Paper Ltd. (Port Arthur Division); Beaver Wood Fibre Co.; Great Lake Paper Co.; Kimberly-Clark Corp of Canada; Spruce Falls Power & Paper Co.; LongLac Pulp & Paper Co.; KVP Co.; Ontario-Minnesota Pulp & Paper Co.; Marathon Pulp & Paper Mills of Canada Ltd.; Ontario Paper Co., and St. Lawrence Corp. (Red Rock Division).

Unions involved are International Brotherhood of Pulp, Sulphite and Paper Mill Unions; International Brotherhood of Papermakers; International Brotherhood of Electrical Workers; International Association of Machinists; International Union of Operating Engineers; International Brotherhood of Carpenters and Joiners of America; United Association of Plumbers and Steamfitters; International Longshoremen's Association, and International Brotherhood of Stationary Firemen and Oilers.

Great Lakes Paper Buys Lumber Firm

Aiming at the full utilization of wood fiber in an integrated pulp and paper industry, Great Lakes Paper Co. recently acquired Patricia Lumber Co. at Sioux Lookout, Ont., about 225 miles northwest of Fort William.

According to Earl Rowe, president of Great Lakes Paper, the mill will continue in full operation producing railway ties and other lumber products. Founded in 1909, Patricia Lumber has supplied ties to Canadian National Rail-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RESULTS IN PERCENTAGE UNIFORMITY
OF 100%—ONE VALVE TO ANOTHER
Accurate contour—accurate diameter—obtained by pilot relay probe follower 1 which follows template contour, actuates a pilot system which through pneumatic-hydraulic action positively positions cutting tool 2 on PUP Inner Valve. Standard interchangeable inner valves, all with same characteristic flow pattern are assured.
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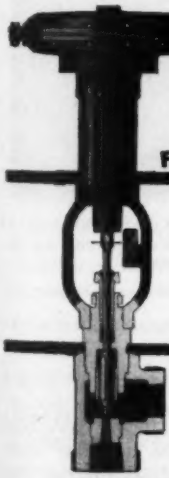
EQUAL PERCENTAGE FLOW CHARACTERISTICS



Type 57T-DA direct acting diaphragm motor valve showing Micro-Form Pup in Fisher high pressure cast steel Design "D" angle body.

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Available in two types, Micro-Flute and Micro-Form. Sizes ¼" to 1". Applicable to control valve sizes 1" to 2"

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LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE CONTROL

Western Canadian Mill Expansion

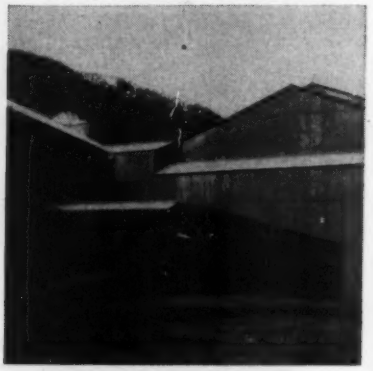
Ocean Falls . . .

1. Continued growth at the Ocean Falls, B. C., operations of Pacific Mills Ltd. is shown graphically on this page. From harbor facilities to the calender stacks, modern and efficient methods are transforming this Canadian wilderness to an industrial center.

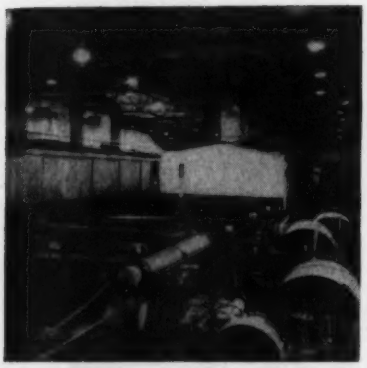
OCEAN FALLS, B. C., townsite for Pacific Mills Ltd., offers fine harbor facilities for fishing and private boats

MODERN HOTEL at Ocean Falls known as the fifth best in British Columbia; single workers use its facilities

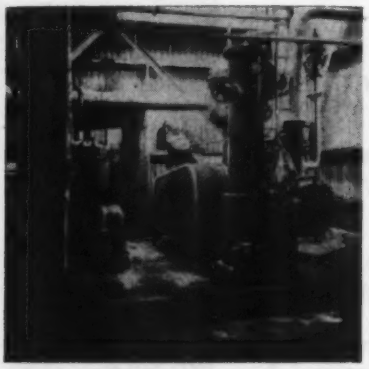
ALL-CEMENT jack ladder to new sawmill of Pacific Mills; cement was chosen because of resistance to sea air



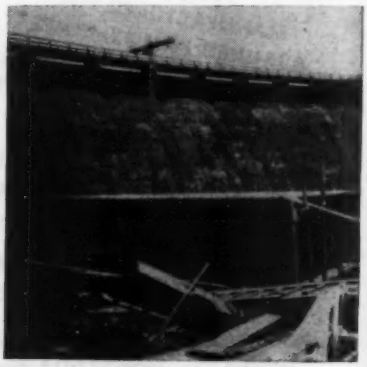
HOGGED FUEL and refuse is not wasted; this steel conveyor removes it to the steam plant for burning



WET END of paper machine; Pacific Mills produces one of Canada's widest ranges of pulp and paper products



PNEUMATIC CYLINDER is operated by compressed air from Ingersoll Rand compressor at Pacific Mills



NEW PUMPING STATION (foreground) is shown in early stages of construction at the base of Ocean Falls dam

ways for more than 40 years. Annual production has been averaging from 10,000,000 to 15,000,000 feet of lumber and 100,000 railway ties.

Powell River Fights for Forest Management License

Powell River Co. hopes to obtain a forest management license in the Powell Lake area of British Columbia. However, the efforts of the firm in this direction have received stiff opposition from small logging operators. At a recent meeting the operators were assured by John Liersch, Powell River vice president, that they would not be pushed from the area; nor would miners, trappers, fishermen, hunters, or those planning hydroelectric development.

The application for the license reserves all mature timber to be available to the highest bidder at public sales. There is an estimated 470,000,000 feet of the resource in the district; small operators cut approximately 10,000,000 feet a year.

There are five responsibilities placed on the firm applying for the license. Each year it must cut the calculated allowable cut for the area. It must assume all responsibilities for fire prevention. If it does not provide protection for itself, it must pay 6 cents per acre yearly to the government. It is responsible for all fires starting on the area. All lands that are bare at present

Harmac . . .

2. The four pictures at the right show typical activity at MacMillan & Bloedel's huge installation at Harmac, B. C., where expansion is on a 24-hour-a-day basis.

WATER for expansion at MacMillan & Bloedel's Harmac, B. C., mill will be supplied through new pipeline

EXCAVATION for new rotary kiln at Harmac was done by a Dominion TM 20 crane and White trucks

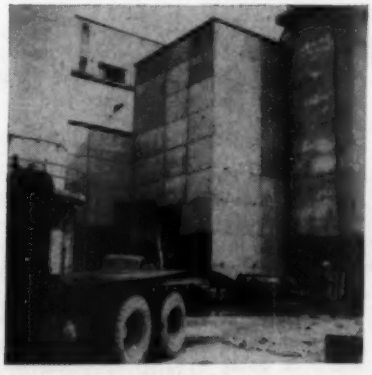
Columbia Cellulose . . .

3. In the three photographs below Columbia Cellulose growth at Prince Rupert, B. C., is shown as an almost never-ending process. Construction crews work night and day.

DOCK at Harmac recently received first vessel—for a cargo to Chile; pier is 380 by 60 feet (see Canadian Notes, page 956)

TWO STACKS rise over conveyors at Harmac mill, Nanaimo; bleached sulphate pulp production will be doubled

LOGS FROM huge management area pass under jack ladder to log pond at Columbia Cellulose mill at Prince Rupert, B. C.



NEW IRON PYRITES burning plant at Columbia Cellulose; ore will come from Britannia mines for sulfur manufacture

PRECAST ROOFING panels were laid over the new water filtration building extension at Columbia Cellulose mill

must be reforested, and all future logging areas must be regenerated. Stumpage must be paid for all logs.

Hooker Forms New Canadian Subsidiary

Hooker Electrochemical Co. of Niagara Falls, N. Y., has announced the formation of a Canadian subsidiary in British Columbia. The move is hailed as the "first concrete step" in a program to construct facilities in B. C. for providing substantial tonnages of chlorine and caustic soda for use in pulp and paper manufacture.

The new firm will construct a plant on a 60-acre site on Burrard Inlet in the North Vancouver district. It is believed that adjacent tidelands will be leased. Approximately 1,000 feet of channel will provide deep water transportation for raw materials and finished products. Low-cost hydroelectric power nearby, as well as excellent rail transportation via the CNR, influenced the selection of the site.

Canadian Producers Hope for Upturn in Pulp Exports

Canadian pulp and paper manufacturers are looking for signs of an upturn in pulp exports. Hard hit by competition from Scandinavian countries, the Canadian industry has been in a slump for six months. "Fact of the matter is that we have been priced out

INAUGURATING THE JOINT PACKAGING program, officials of Gardner Board and Sorg inspect one of the first designs to go into production; they are (l to r) E. T. Gardner, president of Gardner Board; D. G. Driscoll, president of Sorg, and Colin Gardner and Ollie Nash, sales vice presidents of the respective firms

Gardner and Sorg Announce Joint Packaging Program

Gardner Board & Carton Co. and Sorg Paper Co., both of Middletown, Ohio, have announced a new program of packaging for retail merchandise. The program will include the kinds of packages used most in the retail trade. Gardner Board will make and print all types of paperboard boxes of various designs, while Sorg will match these designs with wrapping paper, notion and millinery bags.

The "family" package will not only be jointly made, it also will be jointly sold by the two firms through their respective sales organizations and appointed distributors.

Until the Gardner-Sorg development, retailers had to work through several firms in order to get this type of packaging. The new program will eliminate these bottlenecks and assure retailers that their boxes, wrapping paper, and bags match each other in color and design.

The two firms began work independently on the idea of a family package. Both liked the idea, but both also desired to remain in their own separate fields. Gardner produces paperboard, folding cartons and boxes; while Sorg specializes in sulphite and sulphate papers, facial tissues, grades for printing and converting use, notion and millinery bags, and printed wrapping papers. So, the companies decided to merge their talents. As D. G. Driscoll, president of Sorg, declared recently, "Each of us will be doing what we know how to do best."

Commercial artists retained

Well known commercial artists have been called in to develop designs for the first package series. Some of the designs were displayed when the firms made the joint announcement. The first of the series will be presented to buyers sometime early in 1953. According to the present plans, more designs will be added from time to time, while, for large orders, distinctive designs will be developed for individual retail stores throughout the country.

According to Edward T. Gardner, president of Gardner Board, "For many years Middletown has been noted for its achievements in the industrial field. Many of these achievements have been made possible through the cooperation of different companies here. But, as far as I know, this is the first time that two industrial neighbors have joined hands to make and sell matching products."

---

the market," an official of a large producer declared recently.

Pulp exports constitute a substantial part of Canada's billion-dollar pulp and paper production, totalling more than $350,000,000 last year. Newsprint shipments, by far the industry's leader with exports valued at more than $500,000,000, has suffered considerably less from the competition.

While newsprint prices have been well maintained, pulp quotations have had to be cut by as much as 50 per cent to meet prices being offered by some Swedish mills on some types of pulp. This year Canadian exporters reduced their price on unbleached sulphite from $160 to $140 per ton, and a further cut to $135 was to come into effect for the last quarter.

Canadian Notes

B. C.'s Log Measurement System
has been changed by the provincial government, which will in the future sell all Crown timber on the basis of cubic scales, rather than the traditional board foot log scale. No board foot log scale is ever accurate, and the British Columbia scale, developed more than 50 years ago, is proving progressively unreliable and inaccurate with changes in logging methods and the steady decrease in the size of logs. The cubic contents of a log can be measured readily and accurately.

Westminster Paper Co.
is one of several firms still planning negotiations to obtain a forest management license in the Willow River Valley of British Columbia. The companies are believed to be interested in building a pulp mill at Prince George. It has been reported that Westminster is prepared to make a $25,000,000 installation in the area.

Woodpulp and Newsprint
have been removed from Canada's list of materials declared essential for defense. According to Defense Production Minister Howe, there is no longer a necessity for allocating pulp and paper for strategic purposes.

A Paper Mill and Pine Tree
superimposed on a scroll of newsprint is shown on the new Canadian steel blue 20-cent stamp. Model for the mill was Abitibi Power & Paper Co.'s plant at Smooth Rock Falls, Ont.

Construction Camp Buildings
at Columbia Cellulose Co.'s pulp mill near Prince Rupert, B. C., were swept by fire recently. One man was injured when he jumped from the top floor of a flaming bunkhouse. Only one building of the original camp was saved as the fire destroyed three double bunkhouses, the commissary kitchen, and heating plant.

First Deep Sea Vessel
to land at MacMillan & Bloedel Co.'s new Harmac dock at Nanaimo, B. C., was the motorship *Genanger*, owned by Vesfell Larson Co. of San Francisco. It loaded bleached pulp for shipment to Valparaiso, Chile. The dock, which was designed to minimize handling and exposure to damage, is 380 feet in length and 60 feet wide.

Vancouver Cargo Charges
have been reduced 20 per cent. According to the port manager, the reduction—affecting the basic federal government charge against cargo loaded and unloaded by deep-sea ships—was to be effective July 1. Two years ago the charge was 15 cents a ton. Last year, for the first time in 50 years, a 20 per cent cut was made, bringing the charge

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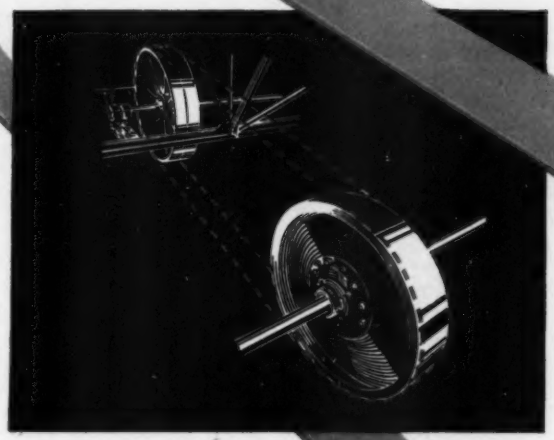

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to 12 cents. Now, with this second 20 per cent cut, the charge is 9 cents.

Powell River Co.
has dedicated a new airfield and a baseball and soccer field at Powell River, B.C. With the completion of the airfield, a 35-minute plane service goes into effect between Powell River and Vancouver.

Dixie Cup Co. (Canada) Ltd.
has completed its 65 per cent increase in production and warehouse space at Brompton, Ont.

An Estimated Loss
of $3,000,000 is faced by the pulpwood industry in New Brunswick as the result of cuts in the prices to be paid producers for peeled and rough pulpwood. The new price for peeled pulp will be $22 a cord, a $2 decrease, while rough pulpwood will now bring $15 a cord, a reduction of $3.

East Asiatic Co.
has taken over Tahsis Co. of British Columbia. Tahsis has timber holdings on the west coast of Vancouver Island and four logging camps. East Asiatic operates shipping services to Europe and the Pacific and is an active lumber exporter in British Columbia. Some time ago the firm gave indications that it might construct and operate a pulp mill, probably a small unit, if timber could be obtained.

New Course in Management Offered at U. of Maine

Prof. Lyle C. Jenness, head of the department of chemical engineering at the University of Maine, Orono, has announced that a new course in paper technology is being initiated in the first semester of the current school year. The course is entitled, "Paper Mill Management" and deals with industrial methods of managing the various operating departments of a mill and the functions of those departments.

Departments studied in detail will include maintenance, power, water, technical control, research, design, quality control, personnel, costs, and purchasing. Teaching the course is Charles M. Howell, who is continuing as a full-time lecturer on the staff of the department of chemical engineering.

Mr. Howell has 24 years experience with Scott Paper Co. and four years' experience as a consultant to the paper industry. During his employment at Scott he served as foreman of the beater room, tour foreman in the paper machine room, head of the technical control department, assistant chief engineer, engineering manager, general plant manager, and was a member of the board of directors several years.

Effective New Brunswick Spraying Spurs Plans for Further Operations

IMMEDIATE CONSTRUCTION of five airfields in New Brunswick as the initial step in a plan under consideration to spray from the air 1,000,000 acres of budworm-infested forest next spring was announced recently in Montreal by Vernon E. Johnson of New Brunswick International Paper Co., president of Forest Protection Ltd. The announcement was made following the first meeting of the board of directors and the election of officers of the organization that will carry out the project.

Forest Protection Ltd., a non-profit cooperative enterprise, was incorporated in New Brunswick September 6. The provincial government and four pulp and paper firms operating in the province are participants. These companies are Bathurst Power & Paper Co., Ltd., Fraser Companies Ltd., Irving Pulp & Paper Co., and New Brunswick International.

The announcement reported that the sites for the projected airfields are now being chosen in the northern part of the province. Construction work was to start in October and is expected to be completed before winter.

Project based on June experiment

The spraying project is being planned on the basis of the spraying operation conducted in New Brunswick in June (see THE PAPER INDUSTRY for September, page 709). Some 200,000 acres in Restigouche County were then successfully sprayed by planes operating from a forest airstrip. Dominion government entomologists have reported almost total kill of the budworm in the area at that time. The June operation was underwritten by the Province of New Brunswick and New Brunswick International Paper, which also constructed the airstrip, organized the spraying, and conducted the operation. Technological support was given by the federal government. The operation was the largest of its kind ever attempted in Canada.

The 1,000,000 acres that Forest Protection Ltd. hopes to spray in 1953 is approximately eight times the size of the Island of Montreal and is part of a much larger area threatened by the budworm. It has been estimated that the heavy infestation now extends to 5,000 square miles, and that further sprayings may be necessary in coming years.

"This wood, most of it Crown land, constitutes a large part of the forest resources of New Brunswick," Mr. Johnson pointed out. "If it should be destroyed by the budworm, future forest operations will be seriously affected. . . . All of Canada has a stake in the success of this battle against the budworm. The federal government has been informed of the situation, and it is hoped that aid will be extended to New Brunswick in this unprecedented emergency. Forest Protection Ltd. is open to all those who have an interest in trying to save this forest. . . ."

The value of the wood in the area that will be sprayed has been estimated at $1,000,000,000 in terms of the products to be made from it. The area contains approximately 10,000,000 cords of softwood. Foresters forecast, from past experience, that more than 50 years may elapse before the forest can be harvested commercially following devastation by the budworm. Large fires often follow in the wake of the insect, as the trees soon decay after being killed and are toppled by the wind.

Officers elected

The appointment of B. W. Flieger as manager of Forest Protection Ltd. was announced by Mr. Johnson. Mr. Flieger, forestry adviser of New Brunswick International, directed the spraying operation carried on in June.

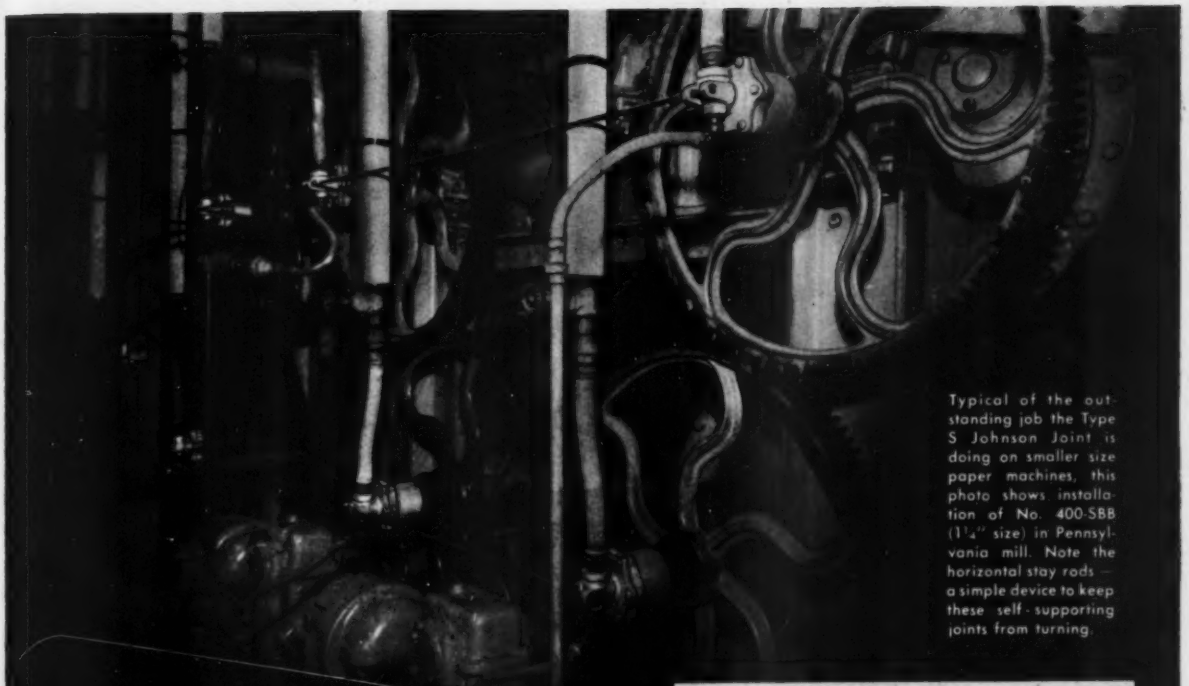
In addition to President Johnson, officers of the organization are as follows: Aubrey Crabtree, Fraser Companies Ltd., vice president; J. H. Ramsay, deputy minister of the New Brunswick Department of Lands and Mines, secretary-treasurer, and J. G. Chalmers and R. L. Weldon, Bathurst Power & Paper; F. A. Harrison, New Brunswick International; K. C. Irving and J. Irving, Irving Pulp & Paper; W. W. McCormack, chief scaler and superintendent of forest management for the New Brunswick Department of Lands and Mines, and R. G. MacFarlane, Fraser Companies. Operating offices of Forest Protection Ltd., have been established in the Sun Life Building in Montreal.

Fire Prevention Education Pays Dividends: AFPI

Continued emphasis on adequate forest protection is paying dividends in the United States, according to American Forest Products Industries. In its annual analysis of the forest protection picture around the country, AFPI this year points to the fact that losses from woods fires during 1951 were the lowest in history.

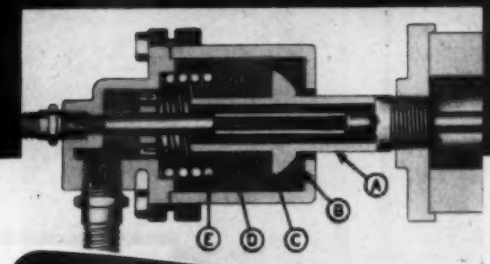
Only 10,780,622 acres of woodland were burned in the U. S. last year—one-third less than the previous all-time low

(*Continued on page* 963)



Typical of the outstanding job the Type S Johnson Joint is doing on smaller size paper machines, this photo shows installation of No. 400-SBB (1¼" size) in Pennsylvania mill. Note the horizontal stay rods — a simple device to keep these self-supporting joints from turning.

A BIG success on smaller paper machines, too!



Cross-section view shows operation of the Type S Johnson Joint. Nipple (A) is connected to roll. Carbon-graphite seal ring (B) rotates against convex surface of collar (C). Guide (D) supports the joint, is also of long-lived, self-lubricating carbon-graphite. Spring (E) is for initial seating only; in operation joint is actually pressure-sealed. Type S Joint above serves for both steam inlet and condensate outlet. Joints shown in installation are similar, but with both inlet and outlet in same horizontal plane to permit head lugs for stop rod. There are also types for single flow service, and other Johnson Joints for every operating need.

It is true, sometimes, that equipment which handles the big jobs doesn't work out so well on the smaller ones.

That's not true about the Type S Johnson Joint.

The picture shows one of the many installations made on smaller size paper machines. Reports from the field show the Type S has already written an unmatched record of serving and saving in such installations.

It requires no lubrication. It has no packing of any kind. It adjusts itself automatically for any variation in pressure. It ends any threat from misalignment because its self-supporting design shifts with the roll.

Yes, big jobs or small, the Type S Johnson Joint takes them all in stride. It slashes down-time and maintenance expense — boosts operating efficiency while it saves its cost.

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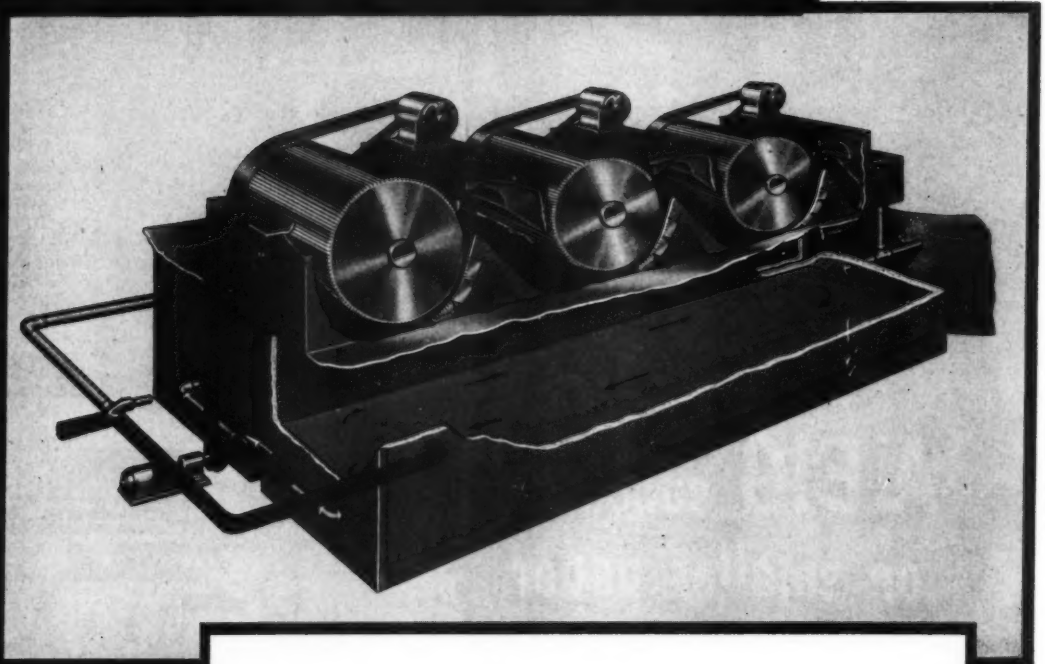
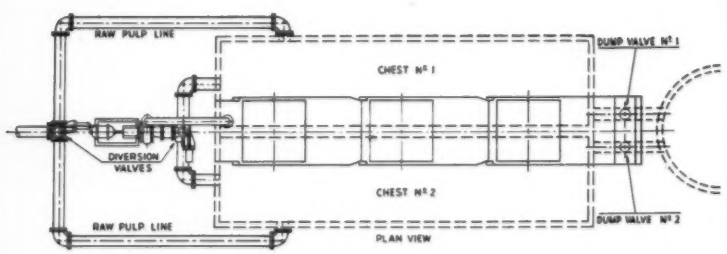
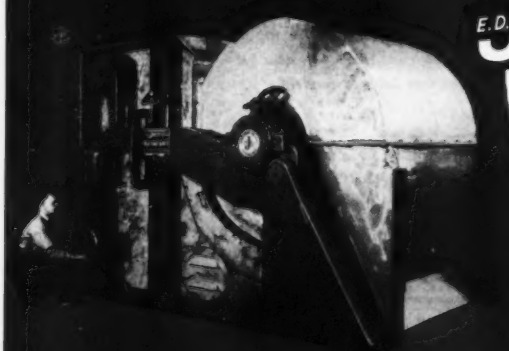
NO DUMPING — NO SHUTDOWNS — UNIFORM TREATMENT —







E.D. Jones Pre-Assembled BEATING UNIT

This easy-to-install "packaged" Beating Unit is the heart of the *Continu-flo* system. • Its pre-assembled construction means lower installation cost—no assembly in the mill ... ved mechanical design em...

LOW OPERATING COST — WITH

E.D. Jones Continu-flo

Double-chest Batching System

Here's the answer to the problem of maximum refining quality at minimum refining cost. The only continuous batching system that guarantees full automatic control, Jones *Continu-flo* double-chest batching with Jones Beating Units offers you

Batch-refining quality with the tonnage and economy of continuous operation

Positive uniform treatment of all stock, with readily reproducible results

Greatest refining capacity and lowest operating cost per ton of any type of beating or refining system.

And no shutdowns for dumping! — because once the Micro-flex Control is set for the required number of passes, operation is continuous and the discharge of refined stock and admission of raw stock is automatic and simultaneous.

Ask your Jones representative or write us direct for details and drawings of this latest Jones development.

E. D. JONES & SONS COMPANY
PITTSFIELD, MASS.

OUTSTA
FEAT

- More refini
to twice c
lar mach
- Lower
65%
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-

Wood Conservation is an Important Aim of the Paper Industry

ONLY two saw cuts saved per stick means approximately a half inch of wood. This seems like a small figure but becomes an astounding one when calculated for the vast amount of wood consumed in the mills today. Norton is building the pulpstones to make this saving possible — stones 66" wide and 69" wide for grinders with a power input up to 5000 horse power.

The engineering skill and experience which developed these giant stones are ready to study your pulp problems and give you exactly the right stone to meet your particular needs — the correct abrasive, grit size and grit spacing to produce from your wood just the kind of pulp you require.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada, Ltd., Hamilton, Ontario

NORTON
PULPSTONES

Making better products to make other products better

Abrasives · Grinding Wheels · Grinding and Lapping Machines · Refractories · Porous Mediums · Non-slip Floors · Norbide Products

recorded in 1949. Sixty-seven per cent of the 1951 fire losses occurred on the 63,624,000 acres of woodland still without an organized system of protection. A total of 31 states provide protection for all their woodlands, the AFPI report states. All but 9.9 per cent of the wooded area covered in the report is protected.

Last year a total of 164,085 woods fires were reported, compared to 208,394 in 1950. Some 35 per cent of these occurred on unprotected land. "The fact that there were fewer woods fires last year despite increased forest use speaks well for the intensive forest fire prevention campaigns underway," according to James C. McClellan, chief forester.

The analysis of 1951 forest fires in the United States showed 78 per cent of the woods fires and 80 per cent of the acreage-burned loss occurred in the South. Virginia, South Carolina, and Alabama are the only southern states that now provide organized protection for all their woodland.

Florida reports highest loss

Florida, with 3,561,388 acres burned, had the nation's highest woodland loss last year. Georgia and Mississippi, each with more than 1,000,000 acres burned, were next. Iowa was lowest in the country, with but 278 acres swept by fire.

Incendiarism continued to be the principal cause of forest fire in the U. S. A total of 39,396 wilfully started fires was reported on protected woodlands last year. More than 36,000 of these occurred in southern states. Careless debris burners started 19,588 fires, and smokers were the cause of 18,390 nationally. These figures cover protected woodlands only.

Wis. Active in Forestry; Mill Sponsors Planting

More than 10,000 Norway pine seedlings were to be planted at a public demonstration September 17 near Newton Lakes, Wis. The project was sponsored by Badger Paper Mills Inc., Peshtigo, as part of the firm's conservation program.

The demonstration and planting were under the auspices of Trees for Tomorrow Inc., the Marinette County Forestry Department, and the state conservation department. The seedlings were set out by machine planters.

Mill foresters discuss problems

The Forest Industries Research Committee of the Lake States, a voluntary organization of industry-employed foresters representing woodlands owners in Wisconsin, Michigan and Minnesota, met at the Trees for Tomorrow Camp in Eagle River, Wis., October 2 and 3. The two-day session was devoted to discussion, intensive field work, and investigation relating to private forestry research. The group, headed by Bruce Buell, chief forester for Northern Paper Mills at Green Bay, is entirely voluntary.

Beginning three years ago, due to interest generated in Hypoxlyn Canker on aspen, the scope of study has been enlarged to include balsam fir growth, the results of disking on poplar, and other promising developments bearing on the potential wood supply.

Up to the present time, the field has been limited to forest growth involving the pulping species, but with expanded interest in forestry manifested in the region and increased employment of foresters in lumber and other forest industries, it is the intention of the sponsors that the program be enlarged to fufill a wider variety of forest experimentation embracing all industries.

Forestry Notes

Approximately 40 Per Cent
of United States commercial forest land is under management practices that provide for continuous growth of commercial forest crops without depletion.

Gulf States Paper Corp.,
Tuscaloosa, Ala., is offering the Westervelt Forestry Fellowships at Alabama Polytechnic Institute. One or more of these fellowships, named in honor of Gulf State's founder, H. E. Westervelt, will be awarded each year for graduate work in forestry. Each grant carries a sum of $2,000.

1,490,000 Cords of Pulpwood
were cut from Florida's forests last year. This 1951 total was 7.6 per cent above 1950 and represents about two-thirds of the pulpwood volume consumed by mills now operating in the state.

FLOATING MINE, on a 200-foot steel barge, being towed to the site of huge sulfur deposits in the Louisiana marshlands; with the unique plant, Freeport Sulphur Co. will develop salt domes near Bay Ste. Elaine; the mine, constructed as a floating unit because of the prohibitive costs of erecting a permanent operation, will pour nearly 2,000,000 gallons of superheated sea water per day into the deposit in order to melt the sulfur; production was to begin late in October.

Canadian Sulfur Supply Position Seen Easing

AS A RESULT of arrangements made with the United States for moving forward the delivery of 15,000 long tons out of the 1953 quota, the Canadian pulp and paper industry's sulfur supply position for the coming winter should be improved slightly.

The development stems from an improvement in the U.S. supply picture. Recently NPA granted users in this country an increase in the maximum stocks they can hold from 25 to 60 days' supply. In view of this relaxation, Canadian authorities sought to obtain a larger quantity of U.S. sulfur prior to the end of the inland navigation season.

Since the 15,000 tons represent only about one-half month's consumption, it is estimated that, even with the additional tonnage, the Canadian pulp and paper industry will start the new year with an average inventory of only 3½ months.

The 15,000 tons just about equal the tonnage that the industry had hoped to get from some new Canadian sources before the end of the year. Due to unavoidable delays, the sources involved (principally industry-sponsored projects) won't be producing until late this year or early next.

Financed by a Franco-Swiss group, a

$4,000,000 sulfur extraction plant is to be built at Roberval, Que., for Sulphur Converting Corp. The new plant will introduce into Canada the Sulfidin process for the extraction of pure elemental sulfur from pyrites. The system is now in use in Europe.

Source of the pyrites for the operation would be the former Chibmac property in the Chibugamau area, it is reported. Earlier this year shareholders of Chibmac approved the sale of the property to Sulphur Converting for 2,000,000 common shares of the latter or on the basis of one Sulphur Converting for each 15 Chibmac.

Capitalized at 2,000,000 shares of $1 par, Sulphur Converting is reported to have some $500,000 for the initial phase of the construction program. The president of the firm is J. A. LecLerc, and the general manager is R. H. Duval, while two engineers from Europe who are familiar with the new process will also be attached to the staff.

Processed Spent Oxide Hailed as Sulfur Source

A long neglected cheap source of sulfur has now become available due chiefly to "know-how" of handling, according to Robert S. Aires, consulting engineer of New York, N.Y. Spent oxide, which is used and reused in the purification of manufactured gas in large populated areas, has been a drug on the market even though its sulfur content has ranged as high as 50 to 60 per cent. Now spent oxide may be burned to sulfur dioxide and in so doing may supplement or replace an equivalent amount of the sulfur requirements of sulfite pulp mills.

Briefly, the process consists of feeding spent oxide to a horizontal rotary kiln countercurrent to the flow of incoming air. Part of the sulfur contained in the spent oxide is burned to sulfur dioxide, the heat of combustion being sufficient to cause vaporization of the remainder of the sulfur content of the material charged. The mixture of sulfur vapor, sulfur dioxide, inert gas, and dust is drawn into a combustion chamber along with secondary air where final combustion of the sulfur vapor occurs. The hot gases are then passed through dust collectors to remove the bulk of the trained iron oxide dust. From the dust collectors the gases are passed into an empty tower and quenched with water. Finally, the gases are cooled and scrubbed in a packed tower to produce a clean burner gas. (This gas may be further treated for purification and conversion to sulfuric acid if desired.)

The fine dust removed from the gas in the packed scrubber is removed with the circulation liquor at the base of the tower. The suspension of solid-in-liquid is concentrated by settling and is finally discarded. The clean burner gas, varying from 10 to 16 per cent SO_2 is mixed with SO_2 produced from an existing brimstone system and absorbed in the sulfite towers in the normal manner.

Any pulp or paper mill located within barge or adjacent rail distance of a manufactured gas works may have a cheap secondary source of sulfur, according to Mr. Aries, which may economically be used to replace or supplement a tight source of expensive brimstone.

Sulfur Producers Urge Removing Price Control

Removal of price restrictions on sulfur would be "in the best interest of the security of the country, the industry, and that of foreign countries receiving the mineral from the United States." This was reported to the National Production Authority recently by producers of native sulfur, who asked NPA to "influence" the Office of Price Administration to remove all controls. The producers claimed that suspension of controls would be an incentive to develop additional sources of supply.

The Native Sulfur Industry Advisory Committee also recommended the modification of NPA Order M-69 on sulfur to eliminate restrictions on use, retaining only the reporting requirements.

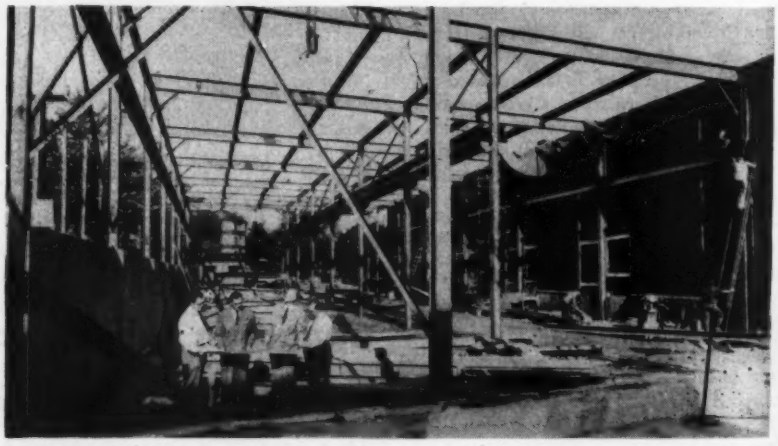
NPA estimated 1952 consumption at 6,090,000 long tons, and a Bureau of Mines official estimated total supply at 6,524,000 tons and the rise in inventories at 434,000 tons. For 1953, his estimates were consumption at 6,637,000 tons, total supply at 7,000,000 tons and the increase in stocks at 363,000 tons.

Sulfur Notes

Shell Chemical Corp.'s Houston, Texas, plant is now operating a unit that will recover up to 55 tons of elemental sulfur daily from waste refinery gases. Construction of the plant was a move aimed at alleviating the critical shortage of sulfur and its most important compound, sulfuric acid.

Sulfur Export Quotas for the fourth quarter have been set at 232,500 long tons for the crude and 7,500 long tons for the refined—the same as in the third quarter. This brings the total 1952 quota of refined sulfur to 30,000 tons, the same as in 1951. The crude sulfur total for this year amounts to 930,000 long tons, 40,000 less than in 1951.

Domestic Sulfur Production during August totaled 447,481 long tons of frasch and 22,902 tons of at least 97 per cent pure, the Bureau of Mines has reported.



COMPANY OFFICIALS survey recent construction work at Rice Barton's addition to its plant in Worcester, Mass.; they are (l to r) Charles S. Barton, president; Angus J. Gardner, vice president in charge of sales; Everett W. Clem, vice president in charge of engineering, and Howard L. Eddy, supervisor of production

Rice Barton Adds New Assembly Facilities

Rice Barton Corp. has started construction of new facilities and additional assembly space that will add 25,000 square feet to the present manufacturing area in Worcester, Mass.

The principal new components of the area will include a one-story steel and glass building to be used for manufacturing facilities and small assemblies; a new manufacturing building approximately 40 feet wide by 210 feet long for the manufacture of paper machine dryers with facilities capable of handling rolls 72 inches in diameter by 300 inches in length, and a roofed area between the existing pattern storage building and the lathe building, to be used for additional chipping and cleaning space.

Additional facilities will make room for new dynamic roll balancing ma-

DO YOU WANT
MAXIMUM
CUTTING
ACCURACY?

INVESTIGATE THE
NEW DOWNINGTOWN
MASSON-SCOTT SUPER CUTTER & LAYBOY

Accuracy in a high speed cutter is essential for the production of a quality sheet . . . to reduce rejections due to imperfect edges and sizes. The Downingtown Masson-Scott Super Cutter and Layboy is a highly accurate cutter which does not sacrifice speed to secure this accuracy. A tolerance of ±1/64th inch or better is maintained over long periods of sustained high speed cutting *without* the necessity for making frequent adjustments.

Specially designed slitting mechanism is a part of the Super Cutter and permits accurate sheet trim and slitting without any additional operations or labor. Another point of accuracy is found in the Layboy of the Downingtown Masson-Scott Super Cutter. Here sheets are piled from the floor upwards in uniform, straight sided stacks. Automatic counters and similar equipment can be supplied as desired.

Your Downingtown Sales Engineer will submit complete data about the Downingtown Masson-Scott Super Cutter and Layboy or write for Bulletin No. 252A.

View showing adjustment mechanism for different sheet lengths.

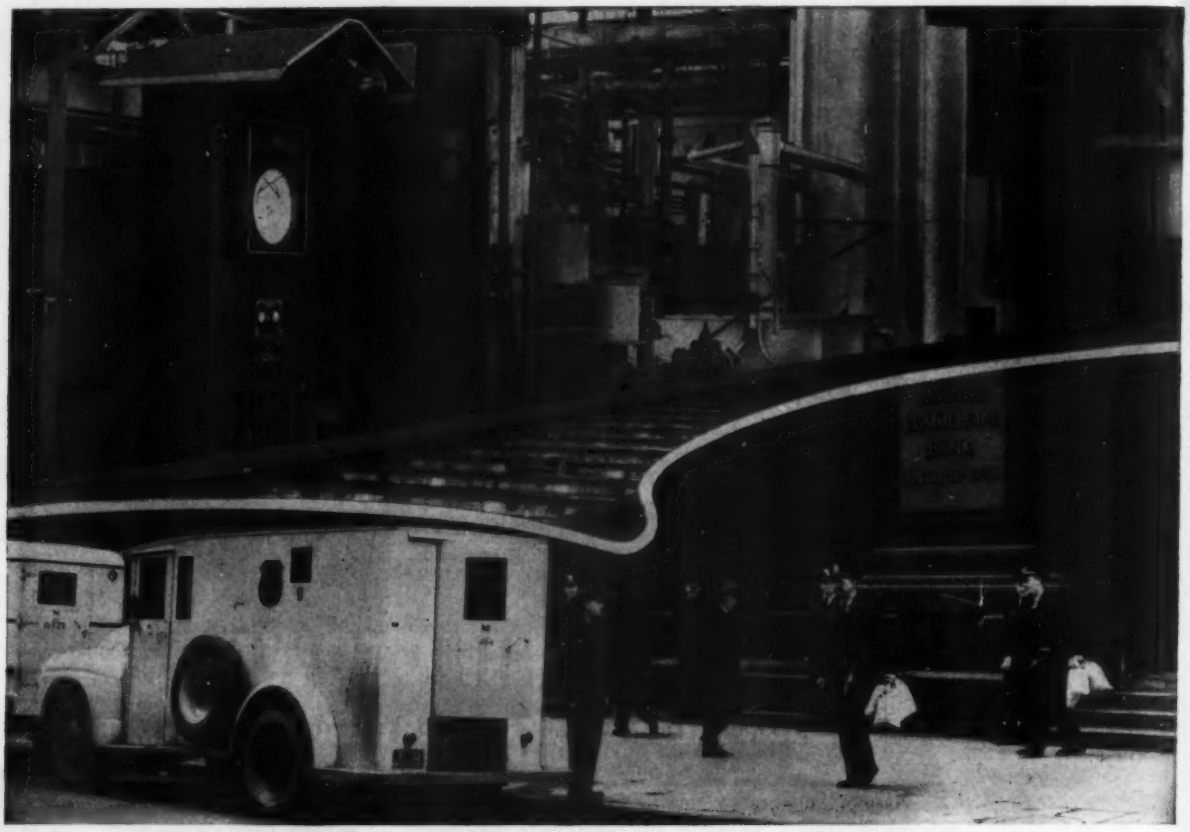
Indicator and mechanism for controlling length of sheet being cut.

MODERNIZATION IS CONSERVATION

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon
Downingtown Fibrepulper, Manufactured in Canada by Waterous, Limited, Brantford, Ontario

DOWNINGTOWN MASSON-SCOTT SUPER CUTTER & LAYBOY
DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880



Modern Safeguards—Brink's for Money, Bailey for Process Materials

Are Your Process Materials Guarded As Well?

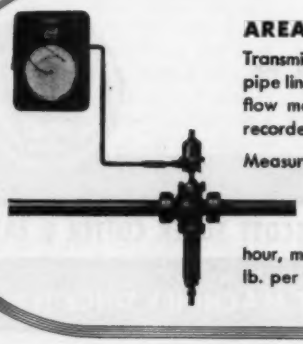
HERE'S HOW TO PREVENT SPOILAGE AND WASTE . . .

TO avoid waste of valuable process materials and finished products, process rates and conditions must be accurately measured and controlled. That's where Bailey Meters, Analyzers and Controllers can help you to improve the efficiency of your plant.

Take flow for instance. Bailey Meter Company offers a complete line of flow measuring and controlling equipment for applications ranging all the way from high pressure steam to low pressure gas. We measure flow in pipes, open channels, ducts, furnaces, smelters, kilns, ovens, dryers.

When you call Bailey Meter Company, you get the help of years of experience as well as recommendations from a wide selection of measuring and controlling devices.

Your local Bailey Engineer is as near as your telephone. He has the experience and the equipment necessary to set up an effective guard for your process materials. P-26



AREA TYPE FLOW METER

Transmitter goes into 1, 2 or 4 inch pipe line like a valve and transmits flow measurements electrically to recorder in remote location.

Measures oil and other clear liquids under static pressures up to 600 psi. Minimum range 0 to 1200 lb. per hour, maximum range 0 to 9600 lb. per hour.

BAILEY METERS

BAILEY METER COMPANY

1058 IVANHOE ROAD
CLEVELAND 10, OHIO

Process Controls

TEMPERATURE · FLOW
PRESSURE · LEVEL
GAS ANALYSIS · RATIO

chinery, which is the largest of its kind ever built. It is capable of great accuracy in dynamic balancing of rolls up to a surface speed of 7,000 feet per minute and is designed to handle rolls 300 inches long.

Other equipment that will be installed includes a 6-inch bar horizontal boring machine, several smaller horizontal boring machines, a large planer, a large surface grinder, and other smaller machine tools.

A. E. Staley Receives Financial Report Award

The 1951 annual report of A. E. Staley Mfg. Co., Decatur, Ill., corn and soybean processor, has been judged the best in the milling industry in a survey conducted by *Financial World*. This is the third year in which a Staley annual report has been awarded the bronze "Oscar" of the milling industry. A total of 5,000 annual reports in 100 industry classifications were judged.

Runner-up in the milling industry was the annual report of General Mills Inc., while the report of Pillsbury Mills, Inc., was placed third. R. S. Bass, Staley treasurer, was to accept the award at a banquet in New York, N. Y., October 28.

SEALING THE CORNER STONE of the new two-story brick addition to D. J. Murray Mfg. Co.'s Wausau, Wis., plant is A. W. Plier, executive vice president and general manager; Fred C. Boyce (left), president of the firm, gave the address of dedication; the addition measures 126 by 115 feet and is concrete and steel faced with brick

Allied Notes

North American Cyanamid Ltd.
has consolidated its several office and warehouse locations in Montreal, Canada, into one newly constructed building. Among divisions of the firm housed in the new structure is Calco Chemicals, which has an extensive laboratory for testing products for the paper, paint, textile, and leather industries.

Babcock & Wilcox Co.'s
Tubular Products Division of Beaver Falls, Pa., has established a district sales office in Syracuse, N.Y. In charge of the new office is J. Y. McCandless, who has been with the firm since 1937.

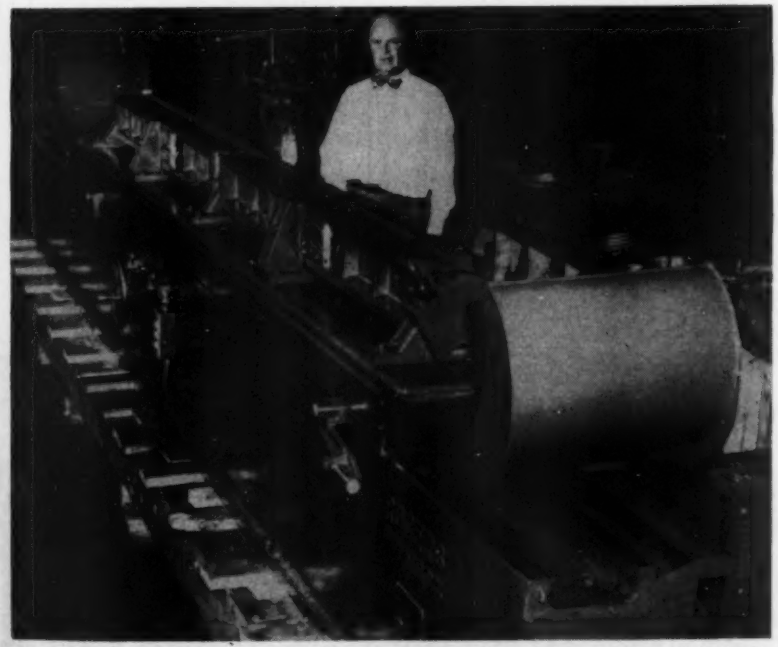
Rice Barton Corp.
has announced that it will produce $2,000,000 worth of machinery for Alaska's first pulp mill, which is to be located at Ketchikan. President Charles F. Barton reported that it will take 18 months to complete the contract with Ketchikan Pulp Co.

Solvay Process Division
of Allied Chemical & Dye was to begin construction in late October or early November of $10,000,000 in new soda ash facilities at its Syracuse, N.Y., plant. The construction will involve practically a duplication of the 15-story soda ash plant put into operation in Syracuse in May.

Chicago Testing Laboratory
has recently created a specialties division and now operates a modern paper testing laboratory engaged in routine testing, development, research, consultation on mill operating problems for manufacturers of paper, paper products, and paper chemicals.

Monsanto Chemical Co.,
St. Louis, announced recently that negotiations are underway for the acquisition of Detergents Inc. and an affiliated firm, Eastern Packaging Co., both of Columbus, Ohio.

W. H. Loomis Talc Corp.,
Gouverneur, N.Y., has announced that its fibrous talc mined in northwestern



DESIGNED TO SPEED atomic production, this massive knife and face grinder with hydraulic fluid motor drive and an 8 by 184 inch magnetic chuck was built by Samuel C. Rogers & Co. of Buffalo, N.Y., for use in the government's atomic energy program; pictured with the equipment is its designer, Arthur F. Moul, Rogers & Co. vice president

New York State is being distributed by Whittaker, Clark & Daniels Inc., New York, N.Y., for all industries except the ceramic trade in Massachusetts, Rhode Island, Connecticut, New Jersey, and southeastern New York.

Allis-Chalmers Mfg. Co.
has purchased the plant of Victor Electric Products Inc., Cincinnati. The purchase fills a need for additional space and shipping facilities for Texrope drive equipment. Within the next few months all Texrope sales, engineering and production will be moved to the new plant from West Allis, Wis.

The Babcock & Wilcox Co.
has purchased the facilities of a former shipyard from the Brunswick Port Authority at Brunswick, Ga. B&W will convert it into a plant to build boilers and related equipment. The property involved consists of about 110 acres with approximately 250,000 square feet under roof.

Wyandotte Chemicals Corp.
recently announced that new facilities for the production of Carbose have been placed in operation, making available commercial quantities of new grades of the chemical for specialized consumer applications. Increased detergency promotion and greater whiteness retention are two characteristics of the material. One of the new grades, Carbose VL, has what is said to be the lowest viscosity of any sodium carboxymethylcellulose on the market; its main applications are at the calendar stack in the paper and paperboard industry.

Hercules Powder Co.,
Wilmington, Del., has announced plans for the erection of an $8,000,000 plant for the production of phenol, para-cresol, and acetone by a unique new process. With this step, the firm enters the field of chemicals produced by hydrocarbon oxidation. Capacity of the plant, which is scheduled for completion in 1953, has not been disclosed. However, it is understood that the production of para-cresol and cymene alcohols will be sufficient to care for the increasing demands of industry.

Walton Laboratories,
Irvington, N.J., has announced the opening of a new sales office and showroom at 30 N. LaSalle St., Chicago. A complete line of industrial and domestic humidifiers will be handled.

Leeds & Northrup Co.,
Philadelphia, has purchased a 125-acre tract of land in North Wales, Pa. Although ultimate use of the area remains to be determined by engineering surveys, the firm contemplates moving to the new location certain operational or laboratory units from its main plant.

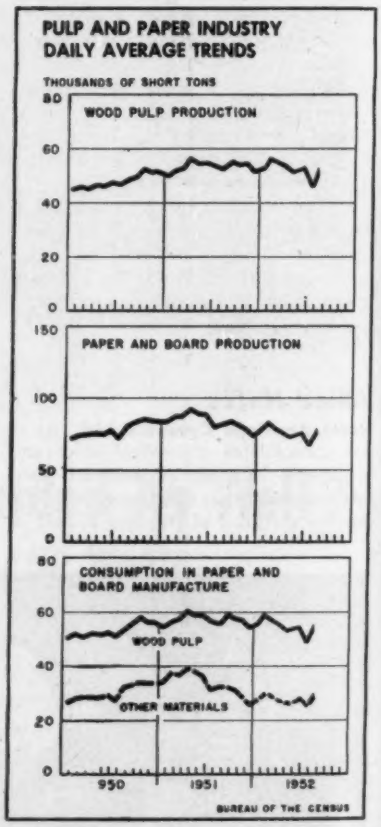
U. S. Paper and Paperboard Production

	August 1952 (tons)	July 1952 (tons)	August 1951 (tons)	Total 1951* (1,000 tons)	Total 1946
Paper and Board, total	2,051,625	1,761,982	2,207,723	26,086	19,278
Paper, total	867,878	765,733	992,950	11,622	8,752
Newsprint	95,091	90,974	97,987	1,106	773
Groundwood paper (uncoated)	62,991	60,033	67,763	789	776
Printing and converting (coated)	88,462	80,736	97,305	1,115	486
Book paper (uncoated)	115,831	97,245	139,749	1,622	1,447
Fine paper (writing, cover and text, bristols, thin paper, and other)	99,882	84,195	116,506	1,364	1,160
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	254,277	216,743	303,254	3,597	2,690
Special industrial paper	31,632	24,395	35,143	419	272
Sanitary paper	92,562	89,454	105,935	1,215	861
Tissue paper	17,753	15,126	20,411	270	184
Absorbent paper	9,397	6,832	8,897	124	103
Paperboard, total	929,217	774,960	979,710	11,605	8,396
Containerboard, total	500,329	414,549	532,947	6,347	4,315
Liners	340,988	275,110	356,953	4,205	
Corrugating material	135,338	116,386	147,981	1,815	
Container chip	24,003	23,053	28,013	328	
Bending board (folding boxboard)	270,989	230,131	282,009	2,429	2,317
Non-bending board (set-up boxboard)	70,743	51,288	63,358	701	521
Cardboard	5,885	4,381	7,554	79	89
All other paperboard	81,271	74,611	93,842	2,049	1,154†
Wet machine board	11,301	8,223	12,047	144	138
Construction paper and board, total	243,229	213,066	223,016	2,716	1,992
Building paper and insulation	117,217	102,981	112,777	1,401	1,036
Hardboard and insulation board	126,012	110,085	110,239	1,315	956

(*) Preliminary report. (†) Includes bending board and non-bending board not for use in box plants. *Source: U.S. Department of Commerce.*

August Pulp, Paper and Board Production

Paper and board production during August amounted to 2,051,625 tons, according to a report released by the Bureau of the Census. This is 7 per cent less than the tonnage produced in August a year ago. In terms of production base capacity, the industry operated at 73.5 per cent in August, with the paper and paperboard sections operating at 74.8 and 71.0 per cent, respectively. The comparable ratios for July were: Total, 63.3 per cent; paper, 66.0 per cent, and paperboard, 59.5 per cent.



Pulpwood receipts at the pulp mills during August were 2,503,729 cords, with consumption at 2,202,825 cords. Month-end inventories increased about 6 per cent to 5,748,076 cords.

Wood pulp production during August amounted to 1,376,296 tons. In terms of production base capacity, pulp production ran at 80.4 per cent, as compared to 70.1 per cent in July.

Wood pulp inventories at the end of August at the paper and board mills were 528,525 tons, as compared to 541,368 tons reported at the end of July. Month-end stocks at the pulp mills increased slightly to 142,284 tons.

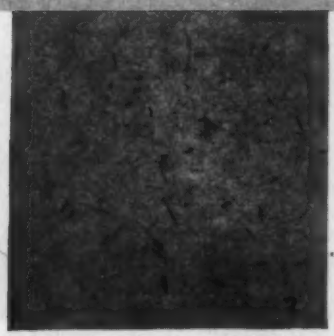
There is only one BEST!

CURLATOR is the ONLY Mechanical Device that will produce from fine screen rejects

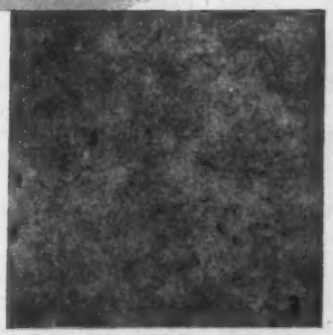
- ✓ A CLEANER PULP
- ✓ OF INCREASED YIELD
- ✓ WITH INCREASED TEARING STRENGTH
- ✓ WITHOUT AFFECTING FIBER LENGTH

SEE THE DIFFERENCE... These unretouched photographs are actual size.

Paper made with fine screen rejects. Note dirt, shives and large fiber bundles.



Paper made with rescreened rejects. Only the largest particles, 8% of the rejects, are removed. Note the large number of shives which passed through the screen.



Paper made with screened, Curlated rejects. 99.4% of the fine screen rejects are in this sheet. Note improvement in cleanliness as a result of Curlation.

Write for more detailed information. See the results obtained from your own pulp.

Actual mill operation proves Curlation eliminates shives and separates the individual fiber bundles, as well as reducing the sizes of dirt particles. This permits a large portion of the dirt to be removed during washing and thickening operations.

Curlation increases yield by converting shives and fiber bundles into No. 1 pulp. With Curlation you no longer have No. 2 pulp and fine screen rejects. Increased yields of 5% are common in many normal pulps.

Curlation imparts a permanent bend and twist to fibers thereby imparting higher tearing strength to paper made from Curlated pulp. Sheet No. 3 has 60% higher tearing strength than sheet No. 2. Curlator patented action rolls fiber and fiber bundles under pressure without reducing fiber length. Curlation does not cut the fibers.

CURLATOR† *Corporation*
EAST ROCHESTER, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

U-SHAPED production flow is shown in this air view of Elk Falls; logs enter the woodroom (foreground) and proceed through the various stages of manufacture by continuous movement to the shipping pier (left background)

North America's newest newsprint mill in operation

THE STREAMLINED NEWSPRINT UNIT of the new Elk Falls Co. Ltd., the official opening of which took place September 15, has been in preliminary production since June 10 of this year. The mill is situated on the east shore of Vancouver Island just two and a half miles north of Campbell River.

The new mill is financed in partnership by Pacific Mills Ltd., Canadian subsidiary of Crown Zellerbach Corp., and Canadian Western Lumber Co., which operates one of the largest integrated forest industries on the Pacific Coast.

Contracts have been taken with Crown Zellerbach for 60,000 tons of newsprint annually, and when the mill is in full production it will produce about 100,000 tons. Crown Zellerbach will sell the newsprint in the United States. The mill has been built at a cost of $90,000 per daily ton of production. This is a total cost of $21,500,000.

Canada is the world's largest newsprint producer, with some 5,250,000 tons annually. Approximately 80 per cent of Canada's output, including Newfoundland, is exported to the U.S., which is the world's largest consumer. The U.S. capacity is only 988,000 tons annually. In 1939 Canada produced 3,175,000 tons compared with 5,176,000 tons in 1949—an increase of 63 per cent or 2,000,000 tons. The United States, England and Scandinavia, the other major newsprint producers, each showed a drop in output over the same period.

In British Columbia there has been a 144 per cent production increase between 1940 and 1950, bringing the output at the end of 1953 to an approximate 464,000 tons.

While there has been active expansion in the existing mills, it is interesting to note that the Elk Falls Co. mill is the first completely new development in 35 years in British Columbia, and the first in Canada in 15 years.

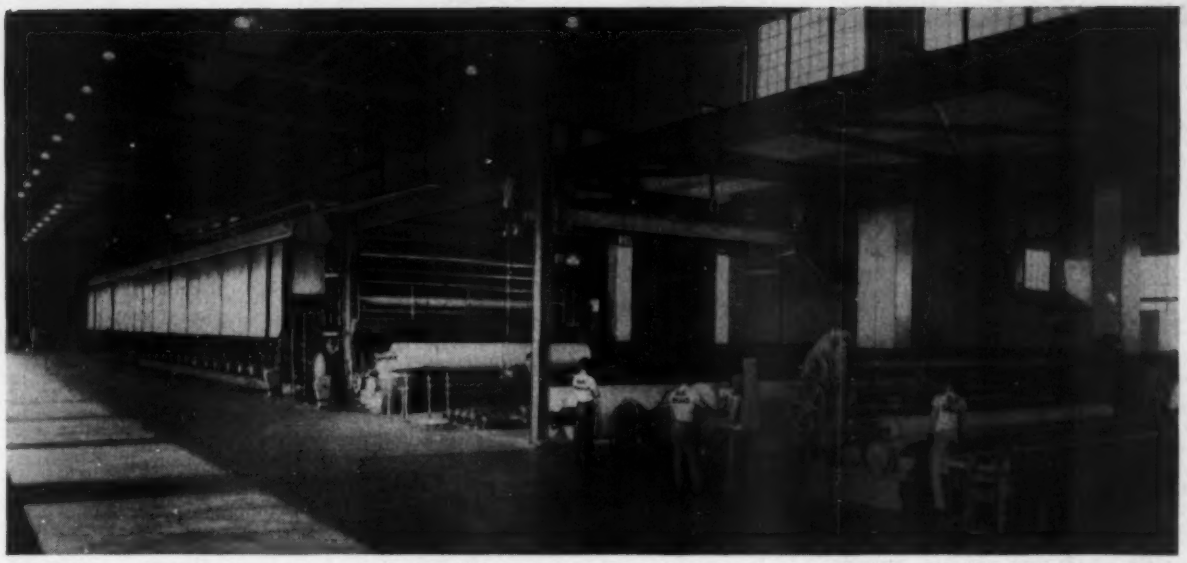
At the peak of construction there were 1,000 men employed at the mill site. There will be no formal townsite, but the town of Campbell River will provide most of the housing accommodation. The company has built 26 homes in various parts of this town, and these will be sold to employees at cost price or less. The development is expected to bring a stability to the community that has hitherto depended on the logging only for its existence. At the same time, a large iron ore mining development has been exploited; and, combined, the two operations are expected to provide many facilities to the community without raising the taxes to the individuals living in the area.

Attending the Elk Falls dedication were (l to r): R. J. Filberg, Elk Falls vice president; H. J. Mackin, Elk Falls president; J. D. Zellerbach, president of Crown Zellerbach Corp., and Paul E. Cooper, Elk Falls vice president

Salvage logging practiced

One of the interesting things about the mill is that it is designed for the use of small material. When we say "small" we mean in comparison to those of many other West Coast operations, which are still logging in old virgin timber and sending their low-grade logs to the pulp mills. Many of them are 4 to 6 feet in diameter—but with decay that renders them unusable for lumber. This mill, however, is operating on salvage material from old logging operations, as well as on the pulpwood material coming from the forests that feed the lumber mills of Canadian Western Lumber.

Only logged-off lands and no-virgin-timber stands are involved in the forest management license area associated with the Elk Falls Co. newsprint mill development at Duncan Bay. The license area is situated on Vancouver Island and islands in Johnstone Straits. It comprises 370,628 acres, of which 237,475 are Crown-owned and 133,475 owned by Canadian Western Lumber. The government granted the company the right to grow trees on this area, and the firm is to pay all



MODERN in every respect, the machine room is almost fully automatic; pictured above is the dry end of the up-to-date 2,000 fpm newsprint machine purchased for the Elk Falls operation from Dominion Engineering

costs and assume all risks and expense in connection with maintaining growth.

Except as a better forest practice measure, and by permission of the provincial government, no reproduction may be cut from the management license until 1974. Thereafter, the area will produce an estimated 15,000,000 feet of timber per annum in perpetuity on a sustained yield basis.

All pulpwood from the management license must be processed at Duncan Bay, and the company was obligated, by terms of the license, to build a newsprint or pulp mill of a designed capacity of 100,000 tons per year at Duncan Bay.

Until wood from the management license becomes available, the Duncan Bay mill will operate on wood from the Canadian Western Lumber operations. This wood will consist of cull logs, sawmill waste, and logging salvage hitherto unused in the coast region of B.C.

Salvage logging may be roughly described as follows: after an area of virgin timber has been logged with heavy, powerful equipment to recover the large timber suitable for manufacture into lumber, the ground is covered with slash. Light, fast, highly mobile equipment is then used to relog the area and recover from the slashing wood suitable for manufacture into pulp. This salvaged wood is of good quality, clean and sound, consisting mostly of hemlock trees too small to be recovered with the heavy equipment employed in logging the big sawlog timber.

Because small trees recovered in relogging have little volume and are light compared to the sawlog timbers, they must be handled fast. These small logs are taken out of the woods in mixed length. Because they do not float well, they are tied into bundles with steel cables and towed in large rafts to the pulp plant. Each bundle contains about 15 cords, and each raft carries about 1,000 cords.

Experience has proved that 25 per cent additional timber volume can be recovered from an area by relogging for pulpwood. This recovery of pulpwood left on the ground after conventional logging is virtually a new industry. There is still much to be learned about improving efficiency, but it has proved to be sound, profitable business in line with efforts to increase the utilization and conservation of our forests.

T. B. Hargreaves
Resident Manager

E. C. Cooley
Resident Engineer

H. C. Graham
Technical Supervisor

C. J. Hague
Personnel Mgr.

D. G. Martin
Office Manager

S. Jemson
Steam Plant Supt.

J. Youden
Machine Supt.

J. L. Marshall
Electrical Supervisor

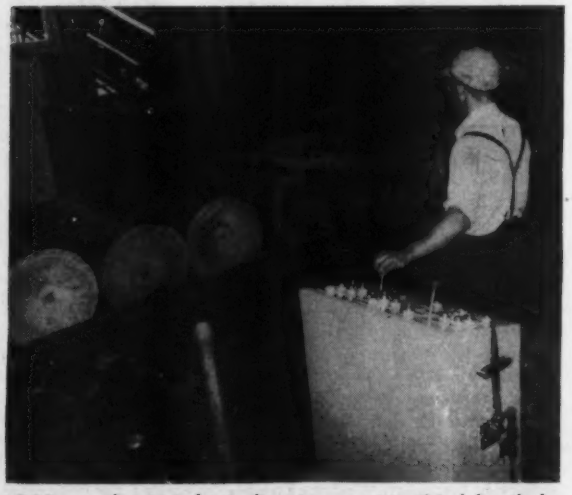
J. W. Hill
Groundwood Supt.

Ladysmith Experiment in salvage logging

Everyone in the timber industry has deplored the waste of leaving small, broken but sound trees to burn or rot after an area of virgin timber has been logged for recovery of the lumber logs. In 1943 Comox Logging & Railway Co., subsidiary of Canadian Western Lumber, interested the provincial government and another company in the experiment of recovering small hemlock trees for making pulp and paper.

HOGGED SAWMILL WASTE is the main fuel supply and is provided by Fraser Mills, huge operation of Canadian Western; Colby crane unloads scows and feeds conveyor

BLOCKS are floated in this flume to the groundwood building—a distance of 1,000 feet; a deflumer piles excess block supplies at the side of the flume for storage



LOGS more than 16 inches in diameter are cut to 49-inch lengths by a swing cut-off saw and split to size by the steam-operated splitter pictured above

Under what became known as the Ladysmith Experiment, Comox Logging salvaged the small trees to be processed into pulp. The provincial government kept data on the entire operation, with the result that much valuable information for future guidance was obtained. It was found that new types of equipment, methods of logging, booming, and transportation were needed to make the operation profitable.

After the Ladysmith Experiment, Comox continued working along these lines, with the result that new methods, different equipment, increased values, and a lot of grief began to pay off. They are recognized as the pioneers in the commercial application of salvage logging.

Salvage logging became profitable for the company, and this long experience will go towards providing a sustained supply of raw material for the Duncan Bay plant at the lowest possible cost.

Aim of the Duncan Bay management license—No. 2, granted by the provincial government under its plan to encourage sustained yield, was to sustain employment in established communities that depend to a large extent on the forest industries. The plan is designed to prove that growing of trees can be an economically sound and good business, in addition to creating a large-scale new industry with a permanent foundation based on sustained yield. Canadian Western Lumber owns other timberlands, tributary to Duncan Bay and not included in the management license.

Tree-farming introduced

Tree farms in this Canadian Western area will contribute to the expansion of the Duncan Bay plant. Such farms, which have grown rapidly into a permanent place in the U.S. forest industry, are regarded as the greatest development in forest exploitation. The old cut-and-run logging practices are being terminated, and the logging of timber which will not mature for many years is already being planned by communities basing their future on sustained yield of the forests.

Farmers in the area will find that a new source of income has suddenly become available to them. So far in most parts of British Columbia there has been little opportunity for farm woodlot operations, mainly because the mills have not been near developed areas where farm woodlots could become a factor. However, it is expected that Elk Falls Co. will encourage this material to be grown, because the mill has been designed to handle it.

Mill site and design

The sulfite pulp for the newsprint will be provided on a contract basis by the Pacific Mills Ltd. plant at Ocean Falls. There will, therefore, be no chemical pulp mill at Duncan Bay until some later date, probably when the market indicates it. Some time ago it was expected that a sulfate mill would be built, which is reasonable, to allow an exchange of species between the mills. However, plans appear to have been temporarily shelved.

The mill site faces the south end of Seymour Narrows on the sheltered coastal shipping route. The main mill buildings are set back from the sea shore, where an outcropping of solid ground gives adequate foundation. Lighter buildings are set nearer the water, thus giving the mill a "U-shaped" flow from the woodroom through the mill processes and back to the shipping facilities. The excavation was started on December 6, 1950, and the first test runs were begun in May 1952, six months ahead of the announced schedule.

The site slopes gently towards the shore, and the area forms a favorable location for the group of structures. None of the main buildings have a ground floor elevation greater than 10 feet 6 inches above the level of the wharf docks. Engineering experience of Pacific Mills contributed generously in the design, construction, and operation of the new plant. The central research department of Pacific Mills and Crown Zellerbach provided technical data and other engineering information.

The building housing the newsprint machine is designed for future expansion, and removal of one temporary wall will provide space for a second similar machine when required.

The plant's woodroom is designed to provide barked cordwood, less than 16 inches in diameter, to the groundwood mill at the rate of 20 to 30 cords per hour. It will supply total daily requirements over a period of 16 hours with an average log size of 6 or 7 inches. With larger logs, the operating time can be reduced accordingly. The building of riveted steel frame construction, fabricated by Dominion Bridge Co., has a heavy concrete floor and walls of prefabricated waterproof plywood.

In design of equipment, emphasis has been placed on welded steel construction. The drives are in the main 1,200 rpm motors through modern speed reducers.

Woodroom operation

The logs are brought from the log pond into the woodroom by a steel log haul with manganese-steel chain. At the entrance to the building the logs are cut into lengths not exceeding 24 feet 6 inches by a 102-inch circular saw. The woodroom is designed so that it can be kept clean and tidy with a minimum of work, thereby increasing its safety. Protected holes in the operating floor are provided for refuse and water disposal discharge to a series of conveyors. Wood refuse is taken to the boiler house fuel storage after hogging. The entire woodroom operation requires a crew of only three men.

A four-chain deck serves as storage for the logs ahead of the barker and enables the barker operator to process his logs independently of the log haul operator. The barker is a No. 20/40 rotary hydraulic log barker by Western Barkers Ltd., with upper and lower rotating nozzle heads mounted on a structural steel frame. It uses water at 1,200 pounds per square inch.

After being cut into 49-inch lengths, the blocks are dropped to a conveyor, which carries them to a 1,000-foot flume leading to the groundwood mill. A travelling wood extractor, mounted on the flume, can be used to unload wood for piling in reserve storage areas alongside the flume, where it can be reclaimed at any time and loaded back into the flume.

Groundwood operation

The groundwood department embraces grinding, screening and thickening, brightening by zinc hydrosulfite process and washing, storage and blending. It forms a continuation of the "wet" end of the machine room building and is built of reinforced concrete with a wood roof carried on steel trusses.

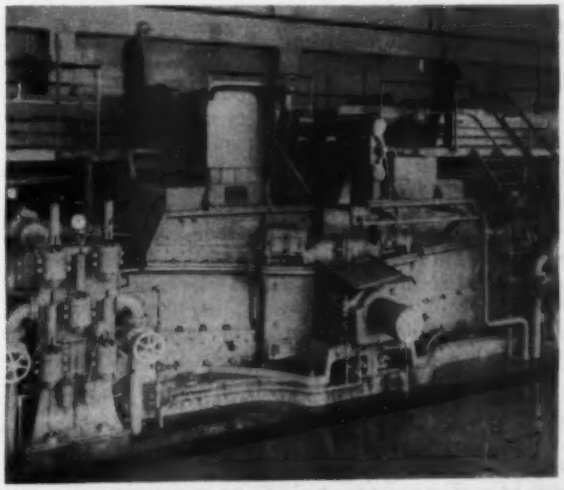
Stock and white water pumps were supplied by Bingham and Allis-Chalmers. Thomas flexible couplings are used for most of the drive units. Sherbrooke Machineries Ltd. supplied the Impco agitators with bronze impellers. Bingham Pump Co. provided the vertical blending tank agitator equipment. All concrete stock and white water flumes, chests and tanks have tile linings installed by Stebbins. Ross Engineering Co. furnished the ventilating and heating equipment.

Grinding of the wood is done by six Waterous Great Northern two-pocket grinders, equipped with 67-inch diameter by 54-inch wide Norton artificial stones. They are placed in lines of two, and each line is driven at 257 rpm through a 72-inch belted type, flexible coupling by a Canadian Westinghouse 5,500 hp synchronous motor. From the grinders the stock is discharged at about 2 per cent consistency into tile-lined flumes.

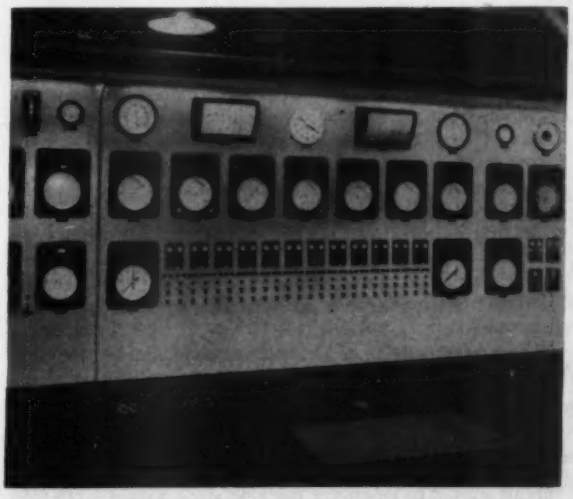
The paper machine

The machine room now houses one 284-inch news machine. Provision has been made for extension of the structure to accommodate a future machine of the same size or larger. A 10-ton Peterson-Cowan freight elevator is situated at one end of the machine room. The building is of reinforced concrete with one temporary wall of plywood and steel framing to

EFFICIENT WOODROOM planned for quick and easy log-handling; the Simons barker on the right has a 40-inch maximum; only three men are required to operate the section



TWO SYNCHRONOUS GRINDERS are driven by one 5,500 hp motor at the Elk Falls mill; pictured above is one of the two-pocket grinder units



AUTOMATIC controls and instrumentation installed in the boiler plant; two boilers installed by Combustion Engineering furnish heat and some of the mill power

SULFITE PULP is shipped to the mill from Pacific Mills Ltd. at Ocean Falls; bales fall into a repulper, the pulp then going to tank storage

provide for expansion. Groundwood stock is brought from a 30-ton capacity wood-stave blending tank.

Principal equipment includes the Dominion Engineering Works paper machine fed by six Bird screens. A Dominion Engineering Works winder supplies newsprint rolls to the Lamb-Grays Harbor finishing equipment. Vapor evacuation and fresh air supply are through a Ross Engineering of Canada hood and fan equipment. The paper machine headbox is patterned after one developed by the Beloit Iron Works in Beloit, Wis., and liquid level is maintained by air pressure in the top of the enclosed headbox.

The fourdrinier section is of the removable type, having adjustable incline with a 284-inch by 100-foot wire. Five Roots-Connersville two-stage vacuum pumps are connected to the couch and press sections. The big Dominion Engineering paper machine, one of the world's largest, incorporates all the latest developments in newsprint making and is built and balanced to run up to 200 feet per minute.

Instruments control and record such functions as press roll loading, temperatures, stock chest levels, valve openings, steam pressures so that the machine is mostly run by push-button control. Equipment for handling the rolls, which is practically automatic, is designed to reduce roll damage to a minimum.

Construction figures

Floor space totals 165,000 square feet in one enclosure—750 feet long by 90 to 147 feet wide, encompassing the major operation from grinding pulp to winding the newsprint rolls.

Size of the $21,500,000 project may be grasped from the following statistics on construction of the mill and the equipment involved: excavation required 460,000 cubic yards; dredging, 360,000 cubic yards; concrete, 24,000 cubic yards; 1,400 tons of reinforced steel; 2,400 tons of structural steel; 7,300,000 board feet of lumber; 2,000 treated fir piles driven to support the structures; 400 electric motors ranging from a fractional horsepower unit of 5 pounds to a 5,500 hp unit of 50 tons.

There are 20 miles of electrical conduit and 100 miles of electrical wire of all kinds. The 3½ miles of wood stave piping for the mill used 37,000 steel pipe bands of various sizes. The 36-inch diameter wood stave pipe to supply water for the mill used 14,200 steel bands of ⅝-inch width and 12,500 one-half inch steel pipe bands. There are 23 miles of steel pipes of various sizes. The newsprint machine alone weighs 2,250 tons. Some 435 freight car loads of material and equipment were shipped to the site.

Warehouse and shipping facilities

Outgoing paper and incoming raw materials at the newsprint plant are handled through the warehouse, main shipping dock, scow unloading dock, and railroad barge dock. The rail car dock provides the mill with rail connections to the mainland by means of car barges, which float six to 12 railroad cars to and from Vancouver.

The 480 by 87-foot warehouse building will store newsprint rolls while accumulataing a shipload. It is built of timber, sheathed with plywood, and there are no interior columns. The storage capacity is 5,500 tons of newsprint rolls.

Most of the newsprint will be shipped by ocean-going steamers, which tie up and load at the main dock. This dock is 64 by 400 feet and has a covered portion 32 by 370 feet. Storage capacity of the covered portion is 1,000 tons, and it is provided with 18 doors which roll up overhead when open. The dock projects out into the bay, and the full length of either side may be used for loading. A covered ramp connects the dock to the plant road system and to the main warehouse. All shipping facilities are engineered and built with permanency, efficiency and economy in mind. The dock pilings are creosoted. Machine-laid asphalt paving gives permanency to the warehouse floor and to the roads.

Water and power

The same drive for efficiency is apparent in the power plant design. With higher fuel costs and decreasing supply of hog waste wood, steam generators were designed for burning more than one fuel. Emphasis was placed on efficient use of both hog fuel and oil. The plant generates 170,000 pounds of steam per hour at 650 pounds pressure. Fuel control is fully automatic to ensure maximum efficiency when burning either hogged fuel or oil. Average steam usage with the mill at full capacity is around 120,000 pounds per hour, with a peak and winter load allowance of 10 per cent.

Steam is supplied by two Combustion Engineering V. U. type, two-drum, water tube boilers equipped with superheaters. Each boiler has a maximum continuous rating of 85,000 pounds of steam per hour when burning hog fuel and 120,000 pounds of steam per hour when burning oil. A 2,000 hp DeLaval five-stage turbine with reduction gear drives a 600 rpm dc generator. A 1,500 hp DeLaval turbine operating 3,600 rpm under similar steam conditions drives a Bingham hydraulic barker pump. There are seven other single-stage DeLaval turbines driving pumps and fans having a total capacity of 910 bhp.

Water through the power plant and mill is unusually clear. The large lakes which feed the Campbell River, source of the mill's water supply, form excellent settling basins. Total length of the pipeline carrying this water to the mill is 14,387 feet. The pumphouse, now housing three pumps, is built to make provision for a total of eight as the mill expands. There are 25,000 gallons of water delivered to the mill daily. The three pumps, including one spare, are Canadian Fairbanks Morse Pomona vertical, water-lubricated type.

The electrical system of the whole plant comprises some 30,730 connected horsepower of electric motors ranging in size up to 5,500 hp. Some 2,790 connected horsepower is served by a turbo-generator using process steam. The balance of the load is supplied by the B. C. Power Commission, which serves the plant with duplicate 138,000-volt transmission lines. Distribution throughout the mill area is at 13,800 volts, using underground cables arranged in a simple radial system. Drive for the paper machine was furnished by Bepco Canada Ltd. and the balance of the major electrical equipment by Canadian Westinghouse Ltd.

Instrumentation at the plant is designed for high-speed production with minimum of complication. Control panels were built by Cemco Manufacturing Co.

Paper and paperboard making—XXIV

HARRY WILLIAMSON

Continuing excerpts from the author's forthcoming book covering all phases of paper and board manufacture. Dealing with the fourdrinier machine and its complexities, these installments will appear serially in The PAPER INDUSTRY. The first—on fundamental principles—will be followed by discussions of such subjects as formation factors, slice velocity, consistency, alignment of fibers in flow, the wire mesh, and others. The current series concludes the presentation of excerpts. Parts I through XX appeared from March 1950 to December 1951 and discussed hydration, the cylinder machine, and beating. Mr. Williamson's book is to be published by Fritz Publications, Inc.

Harry Williams—author of Paper and Paperboard Making

Fourdrinier Machine Fundamental Principles— Part 4

Alignment of fibers

THIS SIMPLY MEANS the fibers in alignment with the linear travel of the wire or fibers formed LENGTHWISE into a sheet of paper. The result is termed "GRAIN", and we use specifications in the paper of WITH and ACROSS the grain.

The standard tests which give us a mathematical expression of success of our papermaking formation in either the alignment of the fibers or the crossing of the fibers are TENSILE and STRETCH.

All fibers will stretch MORE lengthwise than across the diameter of the fiber. ALL fibers will SHRINK MORE across the diameter than in the length of the fiber.

The greater the proportion of the fibers formed in alignment, the higher the tensile and stretch WITH the grain. The more evenly the fibers are crossed with each other in formation, the more nearly equal the tensile and stretch tests with and across the grain.

The most near-to-the perfect formation is that of a hand-made sheet. Here we have no such action as "slice velocity"; we are not compelled to transpose a liquid volume from a VERTICAL DEPTH of tranquil movement into a shallow horizontal flow of high velocity. We have full control of the "random orientation" of the fibers in the water by stirring before we trip the valve which causes the water to flow in a VERTICAL direction through the wire mesh on which it rests.

With care we can make hand sheets with NO GRAIN; the tensile and stretch are EQUAL with and across the formed sheet. To achieve this result on a paper machine making a CONTINUOUS sheet of paper has been the objective of the papermaker ever since the paper machine was invented. It is the reason for all the changes in design of head boxes and slices. All improvements of "shake devices" have their origin in this desire. As we have increased speed and therefore REDUCED FORMATION TIME, we have also of necessity increased slice velocity.

The forces which CAUSE alignment of fibers and therefore differential in tensile and stretch tests or GRAIN have been increased and the TIME available to apply other forces to counteract this alignment of fibers has been decreased. Hence, changes of design and differences of opinion.

Some papers, of course, require alignment of fibers; creping tissues are an example. The special efforts we use to accentuate the flow of alignment of the fibers for this type of paper also accentuate the forces we use to suppress alignment.

Over the years it has become common practice to compare the action of fibers floating in water to that of "logs or tree trunks" floating in a river. Probably this comparison arose from the observation of the logging operations of thousands of trees, shorn of their branches, floating down river from the assembly stacks to the pulp mill pond, from which they are taken and sawn into 4-foot lengths preparatory to the further operations which provide us with the end result of paper making "wood pulp."

This writer has often made use of the analogy of "floating log" and floating fiber and is also on record with the broad, comprehensive statement that "ALL fibers WILL float LENGTHWISE whilst suspended in flowing water until a counteracting flow force, or COLLISION OF FIBER WITH FIBER causes a total or partial change in the flow direction of the fibers or of the water in which the fibers are in suspension."

The fibers are NOT RIGID units. They are FLEXIBLE and responsive to flow forces along the LENGTH of the individual fiber.

Flow pressure on any part of the LENGTH of the fiber will BEND the fiber, thus diverting either the lead end or the trailing end of the fiber from parallel alignment in the flow stream with the travel of the

wire. We may use the analogy of the boat and the use of the rudder. Changing the angle of face contact of the rudder with the flow stream causes the bow or lead end of the boat to change direction of travel; however, the boat is a RIGID unit, and therefore the full length of the boat follows in the direction of the lead end.

Fibers floating in water at the SAME speed as the water in which they are suspended will change direction of flow, just as the boat will, by any applied flow force such as flow currents or collision of fiber with fiber. However, as the fibers are NOT rigid, they can then be as much out of STRAIGHT LINE alignment as a snake wriggling through grass. Providing the fibers do not curl their length into a tangled ball, the interlocking of fibers in all directions will give us more even tensile and stretch tests with and across the grain.

AFTER the delivery of the mixed volume from the slice opening, the orientation of the fibers into the desired formation is solely a question of TIME and the application of controlled RATE of the drainage of water through the wire mesh, whilst the fibers, colliding with each other, settle from suspension and, interlocked with each other, are CARRIED BY THE WIRE and NOT by the water. As long as the fibers are in suspension they will be susceptible to either ALIGNMENT parallel to wire travel by NOT applying forces which will initiate cross currents, or will be crossed with each other by causing cross currents which, in turn, force the fibers OUT OF ALIGNMENT. (See practical use of slice; see shake.)

From a careful reading of the preceding paragraphs, we know we can begin to control formation AFTER the initial velocity of the mixed volume has LOST the power of fiber alignment. A study of the action of the mixed volume in the pond area and the delivery of the mixed volume from the slice opening will clarify to the reader why and how the fibers are transposed from "random orientation" in water to "alignment of fibers" with the STREAM FLOW at the point of emission from the slice opening.

The pond area

Actual alignment of the fibers in flow in the pond area is caused by the confluence of the vertical, horizontal, and intermediate streams in the pond area converging at the slice opening for delivery to the wire.

Such confluence is proportionately greater as the DEPTH of the pond is increased.

At a machine speed of 1500 ft. per minute the depth of the pond "head" is at least 120 inches, or 10 ft. The fibers in the upper levels of this depth, in random orientation and tranquil flow until they come in contact with the impounding wall of the slice, must then change direction and flow DOWN the VERTICAL face of the slice under the pull of the maximum flow velocity through the slice opening.

The medium and lower levels of the confluence of flow in the pond area is at any angle between the vertical and horizontal depending on the arrangement of the baffles or rolls in the head box and pond area. Regardless of any and ALL such arrangements, the purpose of which is to keep the fibers in random orientation, the FINAL flow influence is the flow speed of the confluence of currents immediately ADJACENT TO and actually PASSING THROUGH the slice opening.

At the LOWEST level of the pond area the flow speed of the mixed volume is horizontal and DOES NOT come in contact with either the face or lip of the stationary interference with flow, the slice.

How best can we study the flow influence of converging streams on the alignment of the fibers suspended in those streams?

As we open the slice the mixed volume, rushing through the opening, actuates a flow movement through the whole liquid mass in the pond area. First, a gradually increasing flow tempo of converging currents and then, immediately behind the slice opening a sudden acceleration of flow speed as the confluence of streams is joined.

It is this SUDDEN acceleration of flow speed which causes the fibers to be PULLED into a position LENGTHWISE and parallel to the flow stream. The lead end of the fibers, caught in the speed-up, straightens out the body of the fiber just as if the fiber were a rigid instead of a flexible unit. This is the reason the MAJORITY of the fibers are in alignment with the stream flow at the fractional instant of emission of the mixed volume from the slice opening under the pressure of the "head height" impounded behind the wall of the slice.

The DEGREE of increased acceleration of the flow of the mixed volume, as it approaches the slice opening, is proportional to the pressure exerted by the "head height." Therefore, the LESS the head height, the less drastic the initial alignment of the fibers in suspension.

With a linear foot speed of 225 ft. per minute the "head height" would only be 2 INCHES. Under these circumstances there is NO acute confluence of converging streams, there is NO wide difference in acceleration of flow speed approaching the slice, there is only the intermingling of the vertical flow down the face of the slice, a distance of not more than 1.5 inches, with the horizontal flow from the base of the pond area.

From such a low slice velocity the alignment of the fibers would be much less and immediately the mixed volume became released from the slice the fibers would resume the characteristics of flexible units and become responsive to the flow influences predominating during formation.

Whether the conditions pertaining to the delivery of the mixed volume from the slice opening are those of HIGH HEAD and LONG FIBERS which would result in the greatest percentage of fibers LENGTHWISE in flow suspension, or LOW HEAD and SHORT FIBERS, a slice velocity with very little alignment of fibers in suspension parallel to the stream flow is ONLY important in ratio to the COUNTERACTING FORCES we are able to apply and the TIME available for such application during the actual formation of the sheet on the traveling wire.

The phrase "Time Rate Of Formation" is of the greatest significance and all-embracive in the over-all values of the finished sheet of paper.

A market analyst looks at chemical trends in pulp and paper

Canadian Industries Ltd.
CHARLES R. GRAHAM

Present trends—such as upgrading of groundwood pulp, semichemical pulping of hardwoods, modification of the sulfite process, superbleaching or upgrading of chemical pulps, and the tremendous expansion in sulfite pulping—point to changing chemical requirements of the industry.

THE CANADIAN PULP AND PAPER industry is far different from that of the United States, because it is really three industries rather than one. This is an artificial division but convenient for purposes of exposition. First of all it is an integrated pulp and paper industry producing virtually all the paper and paper products required for Canadian consumption. Calculated from the amount of pulp consumed in each country to produce products for domestic consumption, Canada's integrated industry supplying domestic needs is about 1/13th the size of the United States pulp and paper industry. This is slightly less than might be expected on a population basis, and if this were the extent of the industry, its relative importance as a consumer of chemicals would not be great. But superimposed on this we have a second part of the industry which is devoted to supplying pulp for export; most of this pulp is of high grade—bleached, chemical pulp, and most of it is supplied to the United States. Of all the woodpulp consumed in the United States, Canada supplies about 10 percent. The quantity of this pulp exceeds the quantity of pulp consumed in Canada for all domestic purposes, including the production of newsprint for domestic use. The importance of export markets to the Canadian pulp and paper industry is immediately apparent. It becomes even more clear when we consider the third segment of the industry—a gigantic congregation of newsprint machines supplying newsprint all over the world. Canada produces between 60 and 70 per cent of all the newsprint made in the world. In 1950 this country supplied the United States with 80 per cent of all the newsprint it consumed. In terms of Canada's pulp and paper industry as a whole, and in terms of national importance, the newsprint industry is a giant. Each year it accounts for about half the total value produced by the entire Canadian pulp and paper industry. And the gross value of newsprint production alone provides 3 per cent of the gross national income, while the entire United States pulp and paper industry has a value of output somewhere between 1 and 2 per cent of the United States gross national income.

In summing up the Canadian domestic consumption of pulp and paper is not unusually high, but when, in addition to that, the industry supplies a considerable export demand for wood pulp and a huge volume of newsprint to the United States and to the world, the final result is that the industry is relatively four to five times as important to the economy of Canada as the United States pulp and paper industry is to the economy of the United States.

Chemicals in pulp and paper manufacture

Chemicals enter the picture in the pulp and paper industry even before the trees are cut to make pulp logs. There are many applications of the new insecticides and herbicides to promote healthy forest growth and high yield from woodlots—for instance, the use of DDT to kill the spruce bud worm before the worm kills the tree's buds. There is an experimental use of several chemicals, arsenicals and copper compounds for the most part, to kill the bark on trees before they are felled, which permits easier debarking after the logs reach the pulp mill. There are fungicides to prevent deterioration of the wood after it is felled and before it is pulped. But the great volume of chemicals is used after the logs reach the mill. Most mills must treat the huge volumes of water used in their processes to purify it—with chlorine and, in many cases, with special bacteria-control or "slime control" agents, often organic mercurials.

In pulping the chemicals required depend on the process used. Mechanical or groundwood pulp, chief constituents of newsprint and a number of other papers, is the only pulp that requires no chemicals. For sulfite pulp—used in newsprint, in most fine papers, and as the basis of the cellulose for rayon production—limestone and sulfur are used to form the pulp cooking liquor. So much sulfite pulp is made in Canada that the pulp and paper industry uses 75 per cent of all the elemental sulfur used in that country. The second major type of chemical pulp, sulfate—often, though not quite correctly, called kraft—is cooked in a liquor consisting mainly of sodium hydroxide and sodium sulfide, while appreciable quantities of salt cake are used for make-up of sulfate liquor.

After wood is pulped—either by grinding or by chemical means—it may be used directly to make paper products. More often, however, it is first bleached. Usually it is the chemical pulps which are bleached, and the common agents for bleaching are chlorine, alone, or combined with caustic soda as sodium hypochlorite or with lime as calcium hypochlorite. The production of greater quantities of high-grade bleached pulp for the export market makes the Canadian pulp and paper industry a high consumer of both chlorine and caustic soda; some 60 per cent of the chlorine produced in Canada and some 45 per cent of the caustic soda go to the pulp and paper mills. Paper itself, of course, requires a number of chemical and allied products: dyes and colors, white pigments for fillers, chemicals for sizing and glazing, solvents, and some heavy chemicals. Because of the relatively small size of the Canadian paper industry, the quantities of chemicals used here are relatively much less important.

Chemical trends in the pulp and paper industry

Certain changes now taking place in the pulp and paper industry—and this applies to the United States as much

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as to Canada—are tending to alter, increase, or in some cases, decrease the chemical requirements of the industry. These changes are for the most part in the initial or even the experimental stages. It is too early to assess how far-reaching they will be or, in some cases, which specific chemicals will be used for particular purposes. But these trends point to developments that are probably inevitable over some period of time, and a review of such tendencies may be instructive.

Upgrading of mechanical or groundwood pulp

As economic stands of lumber are found only farther and farther from mills and markets and, as lumbering costs steadily rise, the pressure to make the most out of every cord of wood felled becomes stronger. One result is to use groundwood or mechanical pulp, in various forms, in an ever widening range of uses, because the yield of this pulp is 90 per cent or more, while the yield of most chemical pulps is around 50 per cent. Groundwood can substitute for unbleached chemical pulps in some uses where strength is a minor consideration—the percentage of groundwood in many grades of cheap book and magazine paper, for instance, can be increased. But to make inroads into the fields of higher-grade cultural papers groundwood must be bleached. Developments over the past decade make this possible. It is unsatisfactory to attempt the bleaching of groundwood with the traditional agents—chlorine and the hypochlorites, since too much chemical is used and too much of the pulp is lost.

The peroxides, however, seem to have a decolorizing rather than a true bleaching action on groundwood, and it is possible with their use to raise the brightness of groundwood considerably without losing any pulp to speak of and without incurring excessive costs. Either hydrogen peroxide or sodium peroxide may be used, and several different processes for the application of the chemicals exist. Alternatively, groundwood may be bleached with hydrosulfites—zinc or sodium hydrosulfite—and its brightness satisfactorily improved. This brighter groundwood finds its way into sanitary papers, higher-grade magazine and book papers, and in other uses where low strength and short life can be tolerated.

Production of semichemical pulp

Another answer to the problem of rising wood costs is the development of processes for production of semichemical pulps, also sometimes known as high-yield chemical pulps. These pulps are being produced by several processes and in grades ranging from pulp that is just a little better than groundwood to pulp not quite as refined as sulfite or sulfate. Essentially, the pulping processes are a combination of chemical and mechanical pulping. Wood is chipped, as in the sulfite and sulfate processes before cooking. It is given a short cook, and then the pulping is completed by mechanical means. The resulting pulp gives a yield, on the average, of perhaps 75 per cent of the original wood. It can be used, so far to a limited extent, to substitute for the pure chemical pulps. It is generally bleachable, apparently most satisfactorily with the hypochlorites which are used to bleach chemical pulps; though, in the case of semi-chemical pulps, the loss of yield on bleaching is higher.

Semichemical pulps are adaptations of the sulfite, sulfate, and soda processes for the chemical part of their pulping. Probably the commonest process uses sodium sulfite, with soda ash or sometimes caustic soda. There has been, in the last two years, an added impetus to the development of these semichemical processes, because of the sulfur shortage; the processes give more pulp per pound of chemical used, and the pulp in many instances substitutes for sulfite pulp, a major user of elemental sulfur.

Hardwood utilization

Associated with the problem of high wood costs is the problem of using all the hardwood that grows, along with softwood, in a given timber stand. A certain percentage of hardwood, usually not more than 10 per cent, can be used along with softwood in the traditional pulping processes, and cause no special difficulties. But special pulp cooking cycles, sometimes special cooking liquors, and often special bleaching processes, must be used if a high percentage of hardwood is being handled. A strong argument for believing that semichemical pulps will become more and more important is the fact that they can be made from hardwoods.

New sulfite pulping processes

Sulfite pulp is cooked, by the standard process, in a liquor made by burning sulfur or pyrites and reacting the sulfur dioxide thus formed with limestone to produce calcium bisulfite. The chief defect of this process, at the present time, is that the liquor in most instances cannot be recovered and must be run to waste. In some cases—by making lignosol products, vanillin, or alcohol, for instance—this is avoided, but it is still the general rule.

Discarding sulfite mill liquor is not only wasteful; with the growing outcry against water pollution, this practice will soon have to be abandoned in many locations. Aside from utilization of the waste liquor, the answer has been experimentation with modifications of the sulfite process. Usually the attempt is made to replace the calcium bisulfite liquor with sodium, magnesium, ammonium or another bisulfite, from which some of the chemical values can be retrieved and re-used. In a sense, these processes, when they come, will mean a decrease in the chemicals used because of the avoidance of waste. But, though less sulfur will be used, instead of the limestone now consumed there will be a demand for large quantities of magnesium or sodium compounds, or ammonia, as make-up chemicals or process materials.

Undoubtedly there will come a day when sulfite mills will no longer waste their used cooking liquor. Whether the majority of mills will turn to cyclic processes or to by-product production is a point still to be determined.

Superbleaching

Superbleaching is another name for the upgrading of chemical pulps. Just as groundwood is being upgraded to open new uses to it and provide a better return for each cord of wood cut, chemical pulps are now being upgraded to widen their range of applications. Chemical pulps, which are already high quality products, are superbleached for one of two reasons: to give a high brightness to an already bleached pulp, or to permit reaching a normal standard of brightness with retention of greater strength. This is accomplished by supplementing the usual chlorine and hypochlorite bleaching stages, which if carried too far result in degradation of the cellulose, with a special bleaching stage in which peroxide or chlorine dioxide is used. These chemicals do not appreciably affect pulp strength or yield, but they do raise brightness, resulting in a superior product.

Apart from the question of whether peroxide or chlorine dioxide will be adopted by the majority of mills for superbleaching, the whole market future of superbleached pulp seems uncertain as yet. In some ways, superbleaching is an "all or none" proposition; if a few mills produce this super-quality pulp as standard procedure, the majority of mills might be forced to follow their lead. On the other hand, the pulp may develop as a specialty product commanding a premium price and used in a few specific applications. It may be five years, or even more, before the final direction of this development becomes clear.

The case of sulfate pulp

The trend in sulfate pulp manufacture is not toward change in wood utilization, change of process, or major change in the use of chemicals; it is mainly toward more sulfate pulp pro-

duction. Current expansions in pulping capacity are so often brought about by the erection of new sulfate mills that one is tempted sometimes to think of sulfate as the only pulp that is really growing in output. Though this is not true, the increase of sulfate use has been tremendous. Compared with soda pulp, the production of which is actually decreasing a little each year, and sulfite pulp, which is growing slowly, sulfate pulp is like Jack's beanstock. Satisfactory processes for bleaching sulfate were developed later than those for bleaching other chemical pulps and, though complex and expensive to install, yielded a high-grade product. It is as bright as bleached soda or sulfite pulp and usually stronger. In recent years, sulfate expansion has taken up much of the growth in the chemical pulps market, and the pulp has replaced sulfite and soda pulps in many uses. Now even rayon grade pulps are sometimes made from sulfate, and the end of its expansion is not in sight.

Though sulfate pulp mills recover and recycle their cooking liquors, some chemical make-up is of course required. And here is a ray of hope for hard-pressed caustic-chlorine makers. If caustic surpluses build up in the future, due to production of needed chlorine, the sulfate process may provide an outlet for such surpluses. Also, the production of bleached sulfate pulp requires more caustic soda than the production of any other pulp grade except rayon-quality sulfite. The swing toward sulfate production, therefore, tends to even the balance of caustic and chlorine consumption in the pulp and paper industry.

The case of newsprint

What will happen to newsprint production? Perhaps nothing except increasing output, but there has been much interesting speculation. First, there is a tendency to decrease the amount of sulfite pulp used for newsprint and either replace it with semichemical pulp or increase the percentage of groundwood used. This in itself means nothing other than chemically using less sulfur. But what will the quality of tomorrow's newsprint be? It has been argued that less sulfite means lower brightness, and that some bleaching of future newsprint will be necessary to retain present brightness standards.

Another argument runs as follows: It is likely that newspapers of the future will go in strongly for color printing. If this happens, a brighter newsprint might or might not be demanded. If all newsprint, or even a percentage, were bleached, the demand for the chemicals involved—especially in Canada where newsprint is so important—would be tremendous.

The chemical used for bleaching newsprint might be sodium hydrosulfite, zinc hydrosulfite, hydrogen peroxide, or sodium peroxide; or it might be some other chemical not now applied to the bleaching of groundwood pulp and paper. Supposing for a moment, however, that all Canada's 1950 newsprint production had been bleached with hydrogen peroxide, that would mean a use of 44,000 tons, or about twice the total production of hydrogen peroxide in the United States in 1947. This is a huge demand potential for Canada, a country which now operates only one small hydrogen peroxide production unit.

Chemicals supply to the pulp and paper industry

The chemicals we in the Canadian chemical industry now supply to the pulp and paper industry are, as the earlier parts of this speech have shown, very important to us. Figures like the above possible figure for hydrogen peroxide use show how great the potential is. But a market study of the supply of chemicals to the pulp and paper industry runs into several special problems, even more complicated than those one runs into in routine research. The individual chemical market researcher estimating the volume of chemicals his company can sell to a given industry must determine these things: present consumption of chemicals in the industry per unit of output, and any likely changes in kind or quantity of this chemical consumption; future prospects of the industry itself—how its output is likely to vary; then, in respect to each individual chemical, his company's position as a supplier, opposite existing or prospective competition.

This alone is enough of a task and, in this particular case, the problem of assessing the industry's future is complicated by the dependence of Canadian pulp and paper output on export markets, and hence its dependence on the economic health and economic activity of the United States and the rest of the world.

But there are additional factors, many of them specific to this industry:

(1) How many chemicals will the industry make for itself? Pulping is a chemical process industry; and pulp manufacturers are sometimes reluctant, but never completely unwilling, to manufacture the chemicals they cannot obtain readily and easily. Several Canadian mills have for years operated captive chlorine-caustic soda plants, and two factors tend to bring new mills into this type of operation: (a) the great distances between points in Canada, combined with ever-increasing freight rates; (b) the possibility of producing other chemicals, such as sodium sulfide for sulfate pulping or hydrogen peroxide for special bleaching, from a basic chlorine-caustic soda installation.

(2) How will new processes permitting conservation of chemicals affect total chemicals consumption, or consumption of specific chemicals? Take the possibility that sulfite pulp manufacture might be changed entirely from calcium bisulfite to, say, magnesium bisulfite pulping. The demand for sulfur would drop off, and the only compensating change for the chemicals industry would be a relatively small requirement of magnesium chemicals.

(3) How far will new processes require chemicals that can be manufactured most economically on the site—or because it is impossible to transport them, manufactured only on the site? Here again there is a background of experience in the industry itself. Pulp mills have always made their own sulfur dioxide and of course their cooking liquors. For many years they have made their own hypochlorite bleaching solutions from chlorine and lime or caustic soda, and more recently they have made their own zinc hydrosulfite. Now chlorine dioxide poses an interesting problem. Should it be adopted generally as a superbleaching agent, it would be required in great quantities. But chlorine dioxide is not shippable, and must be made on the site—either from sodium chlorite, or from sodium chlorate, or from hydrochloric acid. Which chemical will be demanded? It depends on which process is generally adopted—and that, no one yet knows.

There are some indications that this trend is being reversed. In Canada some mills will soon be supplied with liquid sulfur dioxide from a new plant of the Canadian chemical industry operating on smelter gas, rather than producing their own dioxide from elemental sulfur or from pyrites. In the United States it is reported that zinc hydrosulfite is now shipped to many mills rather than manufactured on the site. But the making of many required chemicals in the mills will undoubtedly continue to be economically attractive.

(4) How many chemical by-products will the pulp and paper industry eventually produce in competition with the chemicals industry itself? This is not yet an important question, but the present experimental work pointing to the use of vanillin derivatives as chemical intermediates is a straw in the wind.

(5) We finally come, by deduction, to the products of the chemical industry which the pulp and paper industry will use. Undoubtedly they will be important in quantity and varied in kind. But as one surveys each new pulp and paper development, one question arises —one which seldom seems answerable for more than a few months in advance —What will they want?

West Virginia Pulp & Paper Co.'s mill at Luke, Md., where safety's three "E's" are effectively applied

Comprehensive safety at Westvaco's Luke mill

CHLORINE GAS escaping from a processing tank drifted down a passageway between two buildings at the Luke, Md., plant of West Virginia Pulp & Paper Company. In one building about 25 office employees of the plant's power engineering and piping department were at work.

The choking fumes were detected by a plant safety inspector making his rounds. He sounded an alarm for employees in the building and went on to locate the source of the trouble—a pulley belt had slipped from the shaft of an agitator tank in which hypochlorite bleach was being made. Although the heavier-than-air gas blocked all exits, every employee in the building escaped to a safe area without harm. Their escape was made possible through the foresight of the firm's safety and plant protection department, which had provided a supply of small respirators to safeguard occupants of the building against chlorine gas.

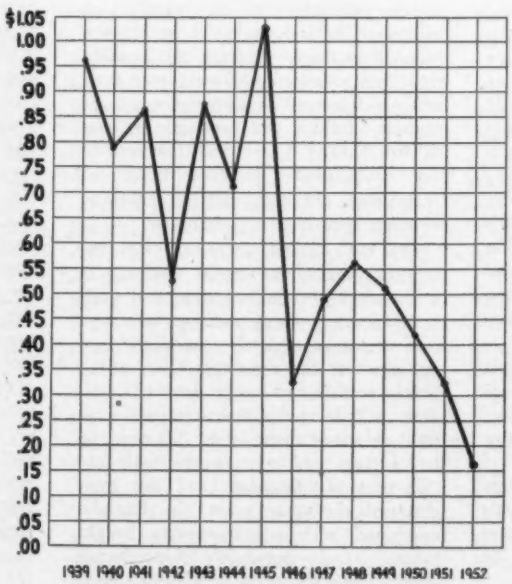
This recent incident typifies the comprehensive safety program which has been developed at the Luke plant, oldest mill of West Virginia Pulp & Paper. It is more of a "safety crusade" than an ordinary program. And it has paid dividends—humanitarian and economic.

It has been responsible for cutting the accident frequency rate at the plant 70 per cent in six years. It has reduced the "cost of accidents" from more than $1.00 per $100.00 of payroll six years ago to 33 cents in 1951, an all-time record low. Accident costs are based on medical, legal, hospital, and compensation expenses.

A. M. Kaiser
Mill Manager

Dan R. Staley
Personnel Director

Accident costs Per $100 of Payroll
As of April—1952



Year Ending October 31

What is more, during the first six months of 1952 the accident frequency rate was even lower than it was last year. And the "cost of accident" figure dropped to 17 cents per $100.00 of payroll in that period. For its 1951 record, the Luke plant received an "Award of Merit" from the National Safety Council. Each employee was presented with an award key ring.

The three "E's"

This record was achieved by applying the three basic principles of safety, the three "E's"—Education, Engineering, and Enforcement—and supplementing them with a fourth: Enthusiasm. John J. Long, director of safety and plant protection at the Luke plant, credits the fourth "E" for a major share of the program's success. Safety enthusiasm has been cultivated at Luke in many ways. But, more important, it has been instilled in every employee from the mill manager, A. M. Kaiser, down. And it has been extended into the 10 nearby communities where the mill's 1,600 employees live.

In 1947 the safety record was bad. During 1946* an average of 18.4 lost-time injuries occurred for every 1,000,000 man-hours worked. For several prior years, the record had not

*Based on the company's fiscal year, from October 31, 1945 to November 1, 1946.

Enthusiasm for safety is stimulated at Luke by a large safety committee; to iron out specific problems, department by department, committee members attend meetings in small groups, as shown here; committee idea was inaugurated in 1947

Award pins for no-injury safety records are presented by Safety Director Long (right) to three employees; the recipients and their records are (l to r) Louis Hicks, 40 years; Robert Moorehead, 30 years, and James Jones, 30 years

been much better. It averaged around 15 or 16 lost-time injuries per 1,000,000 man-hours annually. Improvement since 1946 has been steady. During 1951, there were only 5.08 lost-time injuries for every 1,000,000 man-hours. In the first six months of 1952, the frequency rate was down to 3.6.

Four factors characterize Luke's accident reduction and general safety, fire and plant protection efforts:

1. Decentralization of responsibility for accident and fire prevention to departmental foremen and line supervisors.

2. Emphasis on employee training in the "safe way" to do each job.

3. Interest and cooperation of the union.

4. Stimulation of interest in safety *outside the plant,* as well as inside.

WEST VIRGINIA PULP & PAPER COMPANY

LUKE, MD.

Dear Employee:

During the month of June we experienced three Fall injuries at the Luke Mill, all caused by using equipment unsafely. June was our poorest accident record month of the fiscal year. Most of our injuries this year were caused because the employee's mind was on something else besides his own personal safety. We would like to solicit the help and cooperation of your wife or mother. Would you please have them read the remainder of this letter?

Is the Safety of your husband or son important?
Yes.

It is also very important to us. We conduct a continuous Safety Campaign at a great expense, but we need something else to improve our Safety record that our efforts and money cannot supply. Your help!

Statistics prove that 96 per cent of all accidents occur while the injured party's mind is preoccupied, and is not giving the job at hand undivided attention. None of us are free from a certain amount of worry, such as sickness, financial problems and many other domestic affairs.

Men engaged in hazardous work need clear and undisturbed minds to avoid injuries, as well as the material safeguards that we can furnish to afford safe working conditions. Won't you help by sending your loved one to work every day with a peaceful mind by saying a few words of encouragement, and a plea for him to be cautious?

Think of how great the return for such little effort; that of remaining a wife instead of a widow. Having happy children instead of fatherless children. The joy of maintaining a high standard of living with a productive worker rather than having the responsibility of caring for a cripple, or living alone with just a memory.

Sincerely yours,
John J. Long, Director
Plant and Personnel Protection

Safety committee

With full backing and cooperation of Mr. Kaiser, the campaign started soon after Mr. Long's appointment in 1947. A 12-member mill safety committee was organized at top management level, headed by the general manager. Every division superintendent was named a member. Each superintendent then was made responsible for organizing regular safety meetings among the supervisors in his division. The supervisors, in turn, organized safety committees in their respective departments, the manner in which meetings are held being whatever is most feasible—tool box sessions, general department-wide meetings or shift committees. At these meetings problems pertinent to individual operations are discussed.

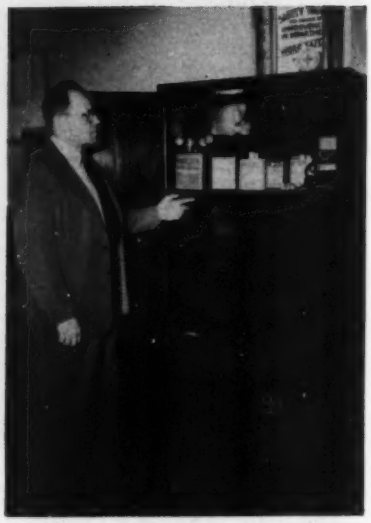
Membership on a departmental safety committee is considered a distinction. In some departments members are *elected*

No injuries for 112 years is the record of the Biggs family, all employed at Westvaco; in the front row are the Biggs brothers, Ralph, Herbert and Harry; in the rear are Herbert's three sons, Royland, Harry Lee and Clarence

Recent addition to the well-balanced supply of safety equipment at the Luke mill is this new instrument to administer artificial respiration automatically; examining it are R. C. Ross (left), safety inspector, and V. E. Kalbaugh, fire marshal

Winner of one of the firm's safety contests for employees' wives, Mrs. Junior Whiteman is shown receiving check

Safety bulletin board greets employee as he enters plant; record of accidents for all departments is posted



Director of safety and plant protection at Luke is John J. Long, shown here beside the "emergency cabinet"

by their fellow workmen. Safety committeemen encourage safety interest, thought and cooperation in their own departments. They report for immediate correction any unsafe practices. While such a large number of individual committees may seem unwieldy, the delegation of functional responsibility to at least 100 men has stimulated interest and cooperation in safety.

The plant also has a full-time safety inspector and a full-time fire inspector, who make daily reports on their tours of the mill. All members of the guard force likewise fill out daily reports, which include safety observations:

Thorough training

With the assistance, support and counsel of Dan R. Staley, personnel director, training a new employee in safety starts before he reports on the job. He is given a short talk about the reasons for all the emphasis on safety, the specific hazards in the department to which he is assigned, general mill-wide hazards, smoking regulaions, identification and use of fire extinguishers and the various types of protective equipment available for his use. Then he receives a 62-page safety handbook describing in detail mill-wide and departmental safety rules.

For the second straight year the Williamsburg, Pa., mill of West Virginia Pulp & Paper Co. has been awarded the Edward Benton Fritz Memorial Trophy for plant safety. In the November 1951 issue of THE PAPER INDUSTRY its safety program was described in detail. An outstanding example of an effective program to combat accidents, Williamsburg's is by no means the only one in the Westvaco family. At Luke, Md., one of the Westvaco mills has compiled a notable record of accident prevention. At the close of the 1951 contest year its accident frequency rate was 6.17. As of August 31, 1952, that figure had been lowered to 2.08, a reduction of 66 per cent.

Department supervisors are responsible for making detailed reports on all accidents involving injury in their departments. These reports not only spotlight the direct cause of the accident but require that remedial action be taken immediately to eliminate the cause.

Prompt attention to correcting safety hazards by the mill's maintenance department is credited with helping to reduce accidents. Unless such cooperation is obtained, all the training given to employees in how to recognize hazards is futile. Less than one-third of all injury-accidents at Luke are traceable to "unsafe conditions."

A weekly safety poster contest has proved highly successful in building interest. Each week a miniature safety poster with a pertinent slogan is inserted in all pay envelopes. A safety committeeman later draws the name of one employee from a barrel in the safety office. The employee then is contacted on his job. If he has the slogan insert on his person and has memorized it; if he is wearing safety shoes (on a job requiring them); if he can tell the number of consecutive days the mill has completed without a disabling injury (the figure is prominently displayed at the main gate), and if his department has not had a disabling injury during the current year, he wins a cash jackpot.

Simultaneously, a safety supervisor telephones the employee's home. If his wife or mother knows the safety slogan or the number of days the mill has completed without a lost-time accident, she too receives a cash award.

Safety begins at home

Believing that wives and mothers of employees can be helpful in cutting down plant accidents, a direct mail campaign is conducted for them. In letters, periodically, it is called to their attention that men engaged in hazardous work need clear and undisturbed minds to avoid injuries. The help of these relatives is solicited to encourage husbands or sons to be careful on their jobs.

To carry the safety crusade outside the plant, the company annually sponsors safety rallies in nearby communities, featuring parades, store window displays, demonstrations, and entertainment. The program is not confined to plant safety; it encompasses traffic and home safety as well. Safety is a 24-hour proposition. Frequent meetings on safety are held with community officials, schools, service clubs and fraternal organizations. Volunteer fire departments are assisted in their training programs by the company's safety men.

The company recently began organizing home safety committees in all nearby communities. Members enrolled include employees, their families, and neighbors. Each is given a membership certificate, receives a monthly bulletin and attends a monthly or quarterly meeting. Interest in attending the meetings is stimulated by arranging for special entertainment, movies, door prizes.

Modern safety equipment

In addition to the "crusading" efforts of the mill to keep all employees and their families filled with enthusiasm for the safety idea, the company also furnishes the best obtainable, Bureau of Mines-approved, protective equipment to cope with the hazards involved in plant operations.

A central safety equipment storeroom, with full-time attendants, is well stocked with all types of apparatus and appliances for safeguarding workmen. Here, such equipment as respirators and goggles are routinely cleaned, sterilized and repaired. Keeping equipment in good condition is one way to win the cooperation of employees for willingly using the safeguards.

This "off-the-job" safety program was conceived because: (1) Accidents in the home far outnumber those in the mill—the ratio is eight to one; (2) worry and concern of employees over accidents affecting members of their families, tend to lower their own efficiency and increase industrial mishaps; and (3) an employee, through the loss of time and income due to an accident in the home or on the highway, upsets the economic condition of his entire family.

An "emergency cabinet" in the mill safety headquarters contains such equipment as Chemox breathing apparatus, which can be worn safely for production or emergencies in atmosphere contaminated by poisonous gases or deficient in oxygen. Instruments to detect concentrations of explosive gases or carbon monoxide are kept ready for use. A new type of apparatus, the Pneolator, to administer artificial respiration automatically in cases of suffocation, gas poisoning, electric shock and other accidents, is included in the equipment.

Because of its geographic location in a valley, the mill continuously is exposed to the hazard of chlorine gas. Huge volumes of this gas are generated and stored in the plant. Instead of hiding the hazard, Luke's safety department constantly reminds employees about it. But the department also emphasizes the precautionary measures taken to combat it. Cabinet storage of small "pocket type" respirators for emergency use of employees in buildings near all sources of chlorine is one example.

Medical center

Fist-aid promotion among employees and follow-up work is handled by the plant's medical staff, headed by Dr. Robert Bess. The company operates a full-equipped medical center with full-time nurses to provide treatment for employees. There is apparatus to determine amount of carbon monoxide in the blood stream. Also, X-ray is used extensively as part of the pre-employment examination and during employment. The preventive program includes cold vaccine for all employees and a supply of drugs for treatment of minor ailments.

"Our philosophy," Mr. Long declares, "is a humane one. Protection of manpower comes first. The economic considerations follow. Our 'Home Safety Committee' is helping prevent home and community accidents that can keep employees off the job just as much as if they were injured while at work."

Perhaps the best example of "safety enthusiasm" is the fact that it took a full week recently to hold the turkey dinner given annually by the mill manager for all employees of departments which completed a full year without a lost-time accident.

In one department, a worker sustained an injury that marred the record. It was the only lost-time accident for the year in the department, but it cost all employees of the department their turkey dinner. That worker personally sponsored a "compensation" turkey dinner at his home for employees of the department.

Centrifugal Pumps

Part 22 of a series . . . Pump control

IGOR J. KARASSIK and ROY CARTER
Application Engineers, Worthington Corp.

A GROUP OF PROBLEMS which today requires more thorough understanding is that dealing with centrifugal pump controls; that is, with control functions and with the means employed to fulfill these functions. This series of articles is intended, therefore, to present a survey of the fundamental control functions encountered in the application of centrifugal pumps, of the type of controls most commonly used and of the technique of control application.

The centrifugal pump is one of the simplest types to control, as compared to reciprocating or rotary pumps. It owes this ease of control to the flexibility of its characteristics and to its adaptability to the varying exigencies of the systems in which it can be applied. But in order to understand the fundamentals of centrifugal pump control, it is necessary to have a clear conception of the relationship between the pump performance characteristics, the characteristics of the system in which the pump operates, and the operating conditions of head and capacity.

Pump and system characteristics

A centrifugal pump installation consists of a system in which the pump is to operate and of the pump itself. The characteristics of the system represent varying conditions of flow and resulting heads, while those of the pump represent the available performance which can be utilized to produce flow in the system. Thus it is necessary to differentiate between these two portions of the installation and to analyze system and pump characteristics separately.

System friction and head curves

It is frequently advantageous to separate frictional losses from the static level and pressure differences, because the former vary with capacity while the latter do not. The friction head loss in a system of pipes, fittings, valves and process equipment (if such is included

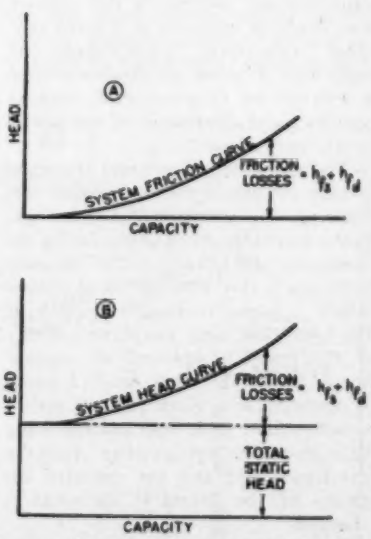


Fig. 1—Two important pump relations: A, system friction curve and, B, system head curve

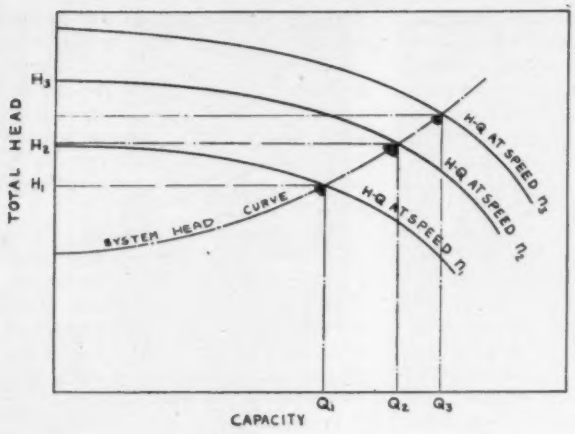


Fig. 2 — Operation of a centrifugal pump at variable speed

in the pumping system) varies roughly as the square of the capacity flow through the system. The curve which represents graphically the relation between capacity and friction head losses through the system is called the system friction curve (Fig. 1-A). When a combination of the friction head losses and of the static heads is plotted against capacity, the resulting curve (Fig. 1-B) is called the system head curve. This curve represents the total operating head required at any given capacity for the system. A pump will always operate at those conditions of head and capacity which correspond to the intersection between its head . . . capacity characteristic at its operating speed and the system head curve.

What is meant by pump characteristics?

There are three prime and interdependent pump characteristics: the pump operating speed, the head, and the capacity. By established practice, the capacities are plotted as the abcissae and heads as ordinates at a given constant pump speed. These heads and capacities, of course, are dependent upon a separate set of pump data, such as various linear dimensions of the pump, areas, and angles.

The application of external factors to modify any one of the fundamental performance characteristics of a centrifugal pump inevitably reacts in modifying the remaining characteristics. For instance, a change in the "external" head against which a pump must operate will, at the same time, alter the pump capacity if the pump is operated at constant speed. If, on the other hand, a pump is operating in a given external system —with a fixed static head and delivering through a given piping system—both the developed head and the delivered capacity will be altered if the speed is changed.

It is possible to vary any combination of two of these characteristics, the third factor remaining constant.

One can also vary all three characteristics simultaneously (Fig. 2), which shows the operation of a centrifugal pump at variable speed and delivering a variable head on a system head curve.

Pressures and heads

In this question of centrifugal pump characteristics, it is also necessary to differentiate between pressures and heads. The former are generally expressed in pounds per square inch above some datum line, such as absolute zero or atmospheric pressure. Heads are expressed in feet of the liquid pumped. When referring to pump discharge or suction conditions they are generally determined with atmospheric pressure as the datum line. Thus, if the discharge head is 250 feet, it is implied that the 250 feet are measured above the atmospheric pressure. If the pump is handling a 15-foot suction lift, reference is made to a negative suction head of 15 feet below the atmospheric pressure.

Meaning of "total head"

When, on the other hand, one speaks of "total head," this head is the algebraic difference between discharge and suction heads (both referred to a common datum, of course) and, as such, is an absolute value, referred to no datum. While system heads may frequently be expressed in pounds per square inch pressures, especially if a definite pressure is to be maintained in a system, it is preferable to convert them into feet of head for the purpose of selecting and applying centrifugal pumping equipment, because a given centrifugal pump, operating at a given speed, will generate a definite total head in feet of the liquid pumped, regardless of the gravity of the fluid, and therefore will develop varying pressures with various fluids.

The average engineer generally has difficulties in dissociating his mind from the conventional total head-capacity characteristic plotted at constant speed. This curve in itself cannot always serve alone in determining the operating characteristics of a pump in a given system. In the first place, in most systems it is desired to maintain some terminal static head or static pressure in the discharge, and it is then the intersection of the discharge head, and not of the total head curve, with the system head curve which determines the operating conditions. Since the suction conditions may vary at different times or even at different rates of flow, it becomes frequently necessary to replot the head-capacity curve in terms of discharge head, or else convert the usual system head curve into a required total head curve by subtracting the suction head from the system discharge head.

In addition, as we have just seen, centrifugal pumps are frequently operated at variable speed, and the constant speed characteristic of the pump is of no value other than in determining the speed at which the pump must operate to develop a given total head at a given capacity.

Once the principles underlying centrifugal pump characteristics and the effect of speed changes on pump performance are thoroughly understood, it becomes necessary to analyze the fundamental functions which centrifugal pump controls may be required to fulfill.

Control functions

The fundamental functions of centrifugal pump controls are, therefore, directed towards permitting the pump to meet the required variations in operating conditions, including the complete absence of delivery demand.

Centrifugal pump controls may be subdivided into two main groups with respect to their function as indicated in the table:

1. Controls which cause complete interruption or resumption of flow.
2. Controls which vary the operating conditions, that is either the pump capacity or the total head, or both.

Interruption controls

It may become necessary to stop delivery if:

1. The source of supply has been completely drained, or at least drained to the desired level;

2. The vessel into which delivery is made has been filled to the desired level;

3. The pressure of the system into which the pump is delivering has reached its required magnitude;

4. A batch process served by the pump has been completed;

5. A system is served by a battery of several pumps operating in parallel and the required rate of flow has decreased to a point where one or more of the pumps could cease to deliver, so as to permit the remaining pumps to oper-

Table Showing Summary of Centrifugal Pump Control Functions

FUNDAMENTAL CONTROL FUNCTIONS			
I—INTERRUPTION AND RESUMPTION OF FLOW	A) START AND STOP OF DRIVER	a) Push button on motor	
		b) Float switch	
		c) Pressure switch	
		d) Power consumption	
		e) Thermostat	
		f) Overspeed governor	
	B) VALVE POSITIONING	a) Manual valve control	
		b) Check valve	
		c) Float or level control	
		d) Pressure control	
		e) Thermostat	
II—MODIFICATION OF OPERATING CONDITIONS	A) MODIFICATION OF PUMP H-Q CURVE THROUGH SPEED VARIATION	1) Driver speed control	a) Manually
			b) Flow control
			c) Float or level control
			d) Pressure control
			e) Temperature control
		2) Power transmission control	a) Flow control
			b) Float or level control
			c) Pressure control
			d) Temperature control
	B) MODIFICATION OF SYSTEM HEAD CURVE THROUGH VALVE POSITIONING	a) Manually	
		b) Flow control	
		c) Float or level control	
		d) Pressure control	
		e) Temperature control	

Table I—Centrifugal pump operating conditions

ate at a more economical point of their characteristic curve, or if

6. Mechanical trouble has occurred in the pump, its driver, or in some part of the system.

Resumption of flow must be caused to occur when the reverse conditions arise, such as an increase in the supply level, reduction of delivery level, reduction of system pressure, or resumption of the batch process.

Types of interruption controls

These controls which cause interruption or resumption of flow can be subdivided into two separate classes:

A. Start or stop of the driver.

B. Opening or closing of a valve in the path of the flow.

Drivers can be started or stopped by means of:

a. *Push-button control,* for electric motors.

b. *Float switches.* These may be applied to maintain predetermined maximum or minimum levels in tanks or reservoirs into which fluid is discharged by electric motor-driven centrifugal pumps.

c. *Pressure switches.* These switches are similar in principle to the float switch, but operate on changes of pressure and are used to maintain pressure in a system or in a closed tank within certain selected limits. The pressure to be controlled is generally applied to a diaphragm actuating the switch.

d. *Power consumption control.* It may be desired to stop the unit when the driver has been overloaded for any number of causes.

e. *Thermostat control.* There exist a number of centrifugal pump applications, especially in process industries, where certain definite temperatures are to be maintained or reached by means of heat transfer, recirculation, etc.

f. *Overspeed governor.* These are applied mainly to steam turbine drivers, although they can also control internal combustion engines or even water turbines used to drive centrifugal pumps. They are intended to protect the driver, the pump, and the system in which the pump is operating. The last two could become endangered if the driver should possess sufficient power to drive the unit at speeds sufficiently high to cause excessive pressures.

Interruption without stopping unit

A great number of installations may require interruption and resumption of flow without stopping the unit. This may be desired either because variations in demand are too frequent to warrant bringing the unit to a stop, because driver starting is too lengthy and complex a process once the unit has stopped, or because interruption of flow by driver stoppage does not prevent certain injurious effects, such as reverse flow through the pump. Flow can be resumed or interrupted through valve positioning without affecting driver operation by means of:

a. *Manual control of discharge valves.* A gate, globe, or plug valve located in the pump discharge can be used to cut off the flow entirely through manual manipulation. This form of control requires the use of a by-pass, to prevent over-heating of the pump when operating at shut-off.

b. *Check valve in the discharge line.* Some form of check valve is almost universally used in the discharge line from a centrifugal pump. It acts to protect the pump, its driver, and the suction portion of the system against damages which may be caused by reverse flow, if the external head in the discharge system should exceed the head generated by the pump or if the pump should come to a standstill and develop no head whatsoever. Reverse flow through the pump would cause it to operate as a water turbine opposite to the normal direction of rotation and, therefore, if the driver is not suitable for this reverse operation, it can become seriously damaged.

c. *Float control valve.* The variation in suction or discharge levels can be transmitted to a mechanically or electrically operated valve in the pump discharge so as to fulfill basically the same function as a float switch.

d. *Pressure control valve.* This form of control bears the same relation to the pressure switch as the float valve bears to the float switch.

e. *Thermostat control valve.* This again utilizes temperature variations to close or open discharge valves instead of operating on the driver itself.

The last three control applications are relatively rare, except in the case where they perform the added function of modifying the pump operating conditions over a wide range and where they, incidentally, are permitted to travel to the full closed position should the externally imposed conditions require it. It must be remembered, however, that

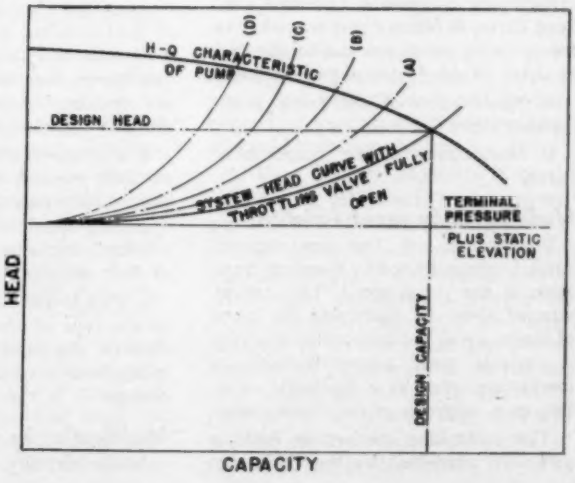


Fig. 3—Curves showing effect of throttling valve to vary capacity

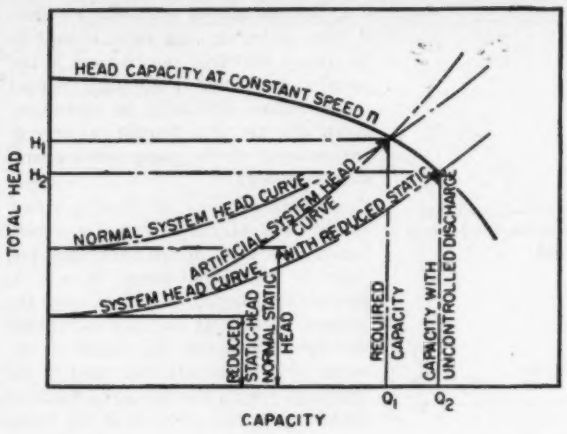


Fig. 4—Curves showing effect of flow control positioning throttle valve

a centrifugal pump should never be permitted to operate against a completely closed discharge, and that a bypass recirculation line must be provided whenever valve positioning control may fully interrupt flow delivery.

Variation of operating conditions

The reasons which may call for a variation in the operating conditions are as multifold as those which may require interruption or resumption of flow. This we may wish to maintain:

1. A constant level, either in the suction or discharge reservoir, irrespective of the variation of supply or demand.

2. A constant rate of flow under varying conditions of static elevation difference between the source of supply and the ultimate delivery.

3. A constant pressure in a system, or a constant pressure margin over some specific pressure, irrespective of the total flow into the system.

4. A constant temperature in a batch process by means of cooling or heating through heat exchagers.

Since the operating conditions of a centrifugal pump are established by the intersection of the head-capacity curve at the operating speed and of the system head curve, it follows that variation of the operating conditions can be obtained by either (Table I) one of two methods:

A. Modification of the pump head-capacity curve.

B. Modification of the system head curve.

Modification by speed variation

Modification of the head-capacity curve is accomplished by means of variation in the pump speed. This can be affected either by modifying the speed of the pump driver itself or by applying a variable speed power transmission mechanism, such as a hydraulic coupling or a magnetic power transmission.

The controlling mechanism itself is generally unaffected by the choice between these two forms of speed change. This choice is generally dictated by the choice of the type of driver best suited for the installation and the relative economy of the several possible driver combinations. If electric motors are used, variable speed operation can only be obtained with dc motors or ac slip-ring, wound-rotor motors. Steam turbines and internal combustion engines lend themselves most conveniently to speed variation and therefore are seldom connected to the driver pump by means of variable speed transmission mechanisms.

Pump operating espeeds may be controlled by means of:

a. *Manual control.* This may require a rheostat for motor-driven units, or a throttle valve control for steam turbines and internal combustion engines.

b. *Flow control.* Such a control is generally based on the desire to maintain a constant flow despite variations in the system head curve. The control speeds up the pump whenever the intersection between the head-capacity and system head curves falls below the desired value and slows the pump speed in the contrary case.

c. *Float or level controls.* The principle of operation here is similar to that of float switches, except than instead of a start-and-stop action, they perform the continuous function of slowing down and speeding up the pump to maintain the desire level.

d. *Pressure control,* as exemplified by constant pressure steam turbine regulators, which maintain at all times an operating speed which will result in a constant discharge pressure, regardless of flow variations.

e. *Temperature control.* The function of this type of control is to increase or decrease the pump delivery in order to maintain a constant rate of head exchange.

Modification by valve positioning

In the majority of installations, however, it is either impossible or impractical to change the pump operating speed, and in order to alter the operating conditions, it is necessary to alter the shape of the system head curve by varying the friction head loss in some part of the system.

Fig. 3 illustrates the operation of a centrifugal pump at constant speed and the effect of a throttling valve used to vary pump capacity. The design capacity is obtained with the throttling valve fully open, while curves (A) to (D) respresent the system head curves corresponding to several positions of the valve, progressively closing. Thus, depending on the required capacity and consequently on the position of the throttling valve, the pump operating conditions will correspond to the intersection of the head-capacity curve with curves (A) to (D) or with any intermediate curve.

Methods of valve positioning

The positioning of the throttle valve may, in its turn, be controlled by:

a. *Manual control.* This is the most widespread application and is used when operating conditions are expected to require infrequent changes. The pump operator progressively closes or opens a gate or globe valve in the pump discharge.

b. *Flow control.* The application of this control to the positioning of a throttling valve is illustrated in Fig. 4, where this valve is automatically operated to maintain the flow at its desired magnitude when the static head is reduced, and therefore the uncontrolled system head curve would intersect the pump and head-capacity curve at an increased capacity.

c. *Float or level control.* The operation is similar to that directed at varying pump speed, except that the level is maintained by artificially altering the system head curve. The boiler feedwater regulator is a typical example of this application.

d. *Pressure control.* The pressure regulator operates in a manner similar to that of the flow or level regulator, except that constant discharge pressure at the pump is maintained by throttling off the excess pressure as capacity demand varies.

e. *Temperature control.* The most common application of this control is to cooling or refrigerating systems, when the type of driver does not permit speed variation.

The next article will deal with the subdivision of control functions into impulse sources, methods of impulse relays and terminal control operation, that is the change of whatever relationship may be required, such as valve setting, pump speed, etc.

More power production with synchronous motors

J. C. MOORE
General Electric Co.

IN THESE DAYS of rapidly expanding production, with the consequent upswing in the installation of plant production machinery, many plant engineers are concerned about increasing the load on power systems that are already loaded almost to capacity. Others are contemplating the addition of new power systems where existing systems obviously cannot handle an expanding load.

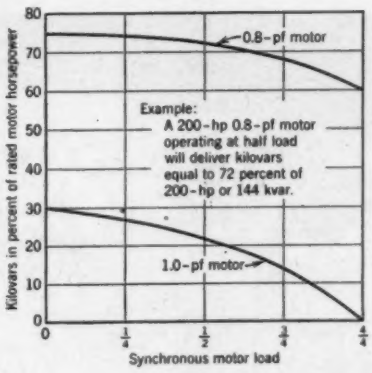
In either case, high plant power factors are of prime importance, because the load which any power system will carry is proportional to the plant power factor, which is expressed as kw load divided by the kva load. The efficiency of the whole plant power system increases as the power factor approaches unity. A higher power factor may make it possible to safely increase the hp load on an existing system. It can also mean less investment in transformers, feeder lines, and voltage regulating devices where a new system is required.

Good operating conditions require high power factors, too. Poor power factor often results in voltage drops which increase the slip of induction motors to the point where production is adversely affected. If the voltage drops more than 10 per cent below normal, it is quite possible for induction motors to become overheated or stall. And high power system losses, poor plant lighting conditions, high power bills, and increased maintenance of the power supply commonly accompany poor power factor.

Poor power factor

In most power systems, poor power factor is caused by excessive demands for magnetizing current (reactive kva) by induction motors at part loads, transformers, electric furnaces, electric welders, and other inductive equipment. This magnetizing current, although necessary, does no useful work, and limits the power which a system can carry.

When a new motor drive (75 hp or larger) is needed in a plant, the installation of a synchronous motor can economically improve plant power factor. A unity power factor synchronous motor (current in phase with the voltage) acomplishes this by adding to the kw load on a power system without increasing the reactive kva load, since it needs no magnetizing current to operate when normally excited at full load. In other words, it brings the ratio kw/kva



closer to 1. For example, if a 1,000 hp unity power factor synchronous motor is added to a 1,000 hp plant load having a power factor of 0.80, the new load of 2,000 hp would have a power factor of 0.935.

A leading power factor synchronous motor (current leading the voltage) improves plant power factor because it acts as a kilovar generator and can supply fairly large amounts of kilovars to a power system while performing its usual driving duties.

The ability of either unit power factor or 0.8 power factor synchronous motors to improve power factor is a function of load and excitation. Decreasing the mechanical load without changing the field excitation increases the reactive kva output of the motor. The chart shows the reactive kva that two typical synchronous motors will deliver under various load conditions with normal excitation. It is seldom economical to operate a synchronous motor at part load in order to gain greater power-factor improvement, and the motor should never be over-excited for this purpose, as this practice can lead to serious overheating.

Voltage stabilization

Another desirable characteristic of the synchronous motor with regard to its effect on the plant power supply is its tendency to stabilize the voltage. Under conditions of high voltage, the reactive kva furnished by a synchronous motor decreases, and under conditions of low voltage within reasonable limits it increases. The motor, therefore, has a tendency to hold a constant voltage in the power supply.

Furthermore, synchronous motors usually have a higher full-load efficiency than any other type of motor and produce a greater amount of work per dollar's worth of power consumed. Where loads are heavy and continuous, an advantage of from 0.5 to 3.0 per cent in efficiency saves a considerable sum in operating expense and leaves more power available for other plant equipment. At reduced loads, the difference becomes greater to a marked degree, for an efficiency of 75 per cent at 5 per cent load has been attained in a synchronous motor.

Whether or not a synchronous motor should be installed for power factor correction depends on several factors. A careful study might reveal that the particular plant and application might lend themselves better to induction motors and capacitors under certain conditions. The total cost, total load, present power factor, and amount of power factor improvement desired all have a bearing on the type of apparatus best suited for improving the power factor.

Other characteristics

Besides their ability to improve the efficiency of plant power systems, synchronous motors have other desirable characteristics which make them especially suitable for many kinds of large motor drives. Some of these are:

1. They may be obtained at low speeds, thus eliminating or reducing the need for speed-reducing gears.

2. The construction of low-speed synchronous motors results in a saving in space along the shaft when the motor is to be overhung or built into the driven machine.

3. Split rotor construction is optional in low-speed types, which facilitates assembly on shaft of driven machines.

4. Low maintenance costs are the result of inherently simple construction which leaves all parts accessible.

5. In ratings where the hp is equal to or greater than the speed, they have a lower first cost, including control and exciter, than any other ac motor with its control.

6. A wide range of torques is available to make possible starting under heavy loads.

7. Dynamic braking brings heavy loads to a smooth, quick stop.

8. Since they run at an exact rated speed, they insure a constant rate of production in constant-speed applications. This constant-speed feature is not affected by voltage changes.

9. They have an inherently large air gap, making field assembly and maintenance easy and economical.

The combined economic and operating advantages of synchronous motors make their consideration worthwhile where any plant requires a new large motor drive. In many instances the installation of synchronous motors is the most economical method of improving plant power factor when their ability to provide efficient mechanical power at the same time is considered.

PAPER SKETCHES

THE ANCIENT ROMANS improved the quality and beauty of the papyrus they imported from Egypt by hammering, pressing and polishing it with ivory

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Each night the agent locked up the section in which the bank's paper was being made, and when the sheets were finished he counted them, receipted for them, and personally carried them to his bank.

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Photographs courtesy of Wool Bureau, Inc.

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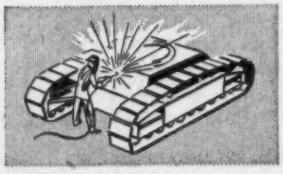
These Link-Belt Speeder PLUS FEATURES mean more work per day at your mill



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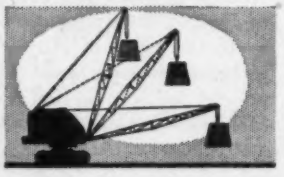

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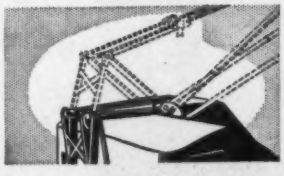

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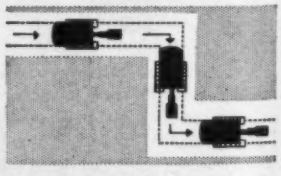

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D. D. McRAE, Ontario-Minnesota, discusses compensation

A. L. COBB, Eastman Kodak, speaks on fire prevention

R. W. GRAY, Union Bag & Paper, at second general session

Paper mill safety discussed at 40th NSC; West Virginia Pulp & Paper wins Fritz Trophy

BOASTING AN ACCIDENT-FREE record for the third successive year, the Williamsburg, Pa., mill of West Virginia Pulp & Paper Co. has been awarded the Edward Benton Fritz Memorial Trophy for 1951. The award was made during the annual meeting of the National Safety Congress' Pulp and Paper Section, held October 20-24 at the Sheraton Hotel, Chicago. The Williamsburg mill was also the 1950 winner.

The trophy, presented annually by THE PAPER INDUSTRY for the best overall achievement among mills participating in the section's safety contest, was accepted at the meeting by two Williamsburg representatives, Ray L. Orris, safety director, and Frank W. Nash, electrician.

Keynoting the meeting, which was attended by more than 160 mill safety representatives from throughout the United States and Canada, was an address by G. W. E. Nicholson, vice president in charge of manufacturing for Union Bag & Paper Corp., New York, N.Y. Speaking at the opening session, Mr. Nicholson stressed the role played by management in an effective safety program. "A good safety record," he declared, "is an expression of competent and enlightened management of modern times. Great progress has been made, but we still have a long way to go.

"Top management must actively participate in the formation of a safety program," Mr. Nicholson continued, "and it must give encouragement as well as active help in order to create enthusiasm."

A. E. MINOR, 1952-53 chairman of the Pulp and Paper Section

Reviewing the methods by which a good plant safety program can be carried through, he suggested the use of films and visual material, the thorough investigation and re-enactment of all accidents, special campaigns, posters, contests, and so on. Most important, the speaker continued, is keen and alert leadership. "... we recognize the great need of capable and competent foremen who will understand and realize the need of safe working habits. . . . The primary responsibility of safety must be assumed by the line organization, as it is a function of the supervisor's responsibility in the same manner as he is responsible for the quality and quantity of the finished product."

A. E. Minor new chairman

Elected to serve as general chairman of the Pulp and Paper Section for 1952-53 was A. E. Minor, safety supervisor for Ontario-Minnesota Pulp & Paper Co. Ltd., Kenora, Ont. Chosen to serve with him were Arthur Carle, safety director for Northwest Paper Co., Cloquet, Minn., vice chairman and program chairman; Dallas E. Henry, safety coordinator for Southern Advance Bag & Paper Co. Inc., Hodge, La., news letter editor, and Ernest B. Lambton, safety engineer for St. Regis Paper Co., New York, N.Y., secretary and membership chairman. The retiring general chairman is Harley B. Goodrich, maintenance and safety engineer for Strathmore Paper Co., West Springfield, Mass.

In making his annual report at the business session on the opening day, Mr. Goodrich revealed that 19 new memberships were added to the section during the past year, while there were six cancellations. Thus, the section enjoyed an increase of 13 memberships. As of the last of September, he said, there were 709 primary affiliations and 360 secondary affiliations, making a total membership of 1,069.

Mr. Goodrich reviewed the work of the section during the past year, making specific reference to the appointment of Dan Adair as NSC staff representative. "One of the greatest additions our section has received from the Council in some time was the appointment of Dan Adair to our section as the staff representative," he said. "Dan is from the West Coast and is well acquainted with the woods and the problems of the pulpwood people. He is rapidly becoming ac-

Fritz Trophy to Westvaco for Second Straight Year

The winner of the Edward Benton Fritz Memorial Trophy in the 1951 safety contest of the Pulp and Paper Section was the Williamsburg, Pa., mill of West Virginia Pulp & Paper Co. The operation is a completely self-contained sulfate pulp and paper mill having a daily rated capacity of 75 tons of pulp and 80 tons of paper. The mill won the same award for its accomplishment in 1950 (see The PAPER INDUSTRY for November 1951).

RAY ORRIS of Westvaco accepts Edward Benton Fritz Trophy from A. Scott Dowd

In presenting the trophy, A. Scott Dowd, president of Fritz Publications Inc., said in part, "Between January 1, 1951, and December 31, 1951, an average of 484 employees worked 994,163 man-hours without a lost-time accident, to complete the contest year with an accident frequency rate of zero. This gave the mill a perfect record of more than three years. As of December 31, 1951, it had worked a total of 3,081,526 man-hours since the last reportable injury. . . .

"For this achievement the Williamsburg mill was given the Award of Honor by the National Safety Council, in accordance with the plan officially adopted by the Industrial Conference through its statistics and contest committee and approved by the Council's board of directors through its committee on contests and awards."

Mr. Dowd called attention to the task faced by the judges in selecting a winner from the 274 pulp and paper mill contestants, 12 of which had perfect scores. "We are specially thankful," he said, "to the following gentlemen who studied the reports submitted by the group winners and made their selection of the top prize winner: G. E. Sanford, formerly safety director for General Electric Co., Schenectady, N. Y.; W. H. Graff, supervisor of safety for United States Rubber Co., New York, N. Y., and H. F. Reinhard, consulting engineer for Union Carbide Corp., New York, N. Y."

quainted with the paper industry, and we hope he will be a second Pete Marconi."

Safety code

The cooperation of the American Paper and Pulp Association in the development of a safety "code" for the industry was made public by Mr. Goodrich in his report. The APPA through its board of directors has announced that it will act as co-sponsor with the National Safety Council in the development and preparation of a revised safety standard for pulp and paper manufacturers.

The history of the safety "code" idea was reviewed by Mr. Goodrich in his annual message. "In 1936," he declared, "after long deliberations a tentative standards code for the pulp and paper industry was adopted and issued by the American Standards Association as a code of safety for pulp and paper mills. . . . In 1947 our executive committee thought the code should be revised and brought up to date. At the 1948 Congress we voted to propose the revision of this code. For four years we have been endeavoring to rewrite the code. It is our intention to develop a standard which is feasible and which will call for such safety requirements as the industry wants. . . .

"Our frequency rate appears to be high, because few persons are required to operate a paper mill, thus man-hours do not build up fast, so that a frequency rate based on million man-hours worked appears high. One lost-time injury means a great deal when figuring frequency.

"The American Paper and Pulp Association has agreed to act as co-sponsor of the new standard, and you may expect some action towards revision and adoption of that new standard. We shall need the assistance of every one of you . . . so that it will be workable and satisfactory to our industry."

Scott offers additional trophy for 1953 contest

The Pulp and Paper Section, during its annual meeting, accepted the offer of Scott Paper Co., Chester, Pa., to donate an award to be given at the annual Safety Congress to that company member of the NSC whose combined operations of all its plants has resulted in the best safety achievement for the year. Mills participating in the 1953 Paper Industry Safety Contest will be eligible.

Details governing this award for incorporation in the rules of the 1953 contest are being worked out by the Council and the section's contest committee. Members of that committee are J. Fred Berry, personnel manager for Alton Box Board Co., Alton, Ill.; Harley B. Goodrich, maintenance and safety engineer for Strathmore Paper Co., West Springfield, Mass.; James N. Conaway, safety manager for Scott Paper Co., Chester, Pa., and A. Scott Dowd, president of Fritz Publications Inc., Chicago (chairman).

1951 annual report Pulp & Paper section

An outstanding record of safe working conditions in 1951 was reviewed by A. Scott Dowd, chairman of the contest committee and president of Fritz Publications Inc. In his annual report to the section, he declared, "The overall cumulative frequency rate six years ago was 19.24. Last year the rate was 9.83, or 17 per cent below the national average of 11.80 for all companies in the paper industry that reported their experience to the National Safety Council. . . . Fifty-three per cent of the total enrollment in 1951 had frequency rates below 10. Thirty-two units, consisting of 12 mills and 20 converting plants, completed the 1951 contest with perfect scores.

"There were 124 plants, aside from group winners, in the 1951 contest that had frequency scores below their group averages and also reductions by comparison with their rates in the previous year.

"In the current 1952 contest there are 458 contestants, consisting of 289 pulp and paper mill units and 169 converting plants. In addition, there are four participants whose exposures are below the minimum requirement."

Honorable mention to U.S. Gypsum

Following his announcement that the Williamsburg mill of Westvaco had won the Fritz Trophy, Mr. Dowd declared that the board of judges had awarded honorable mention to the Oakmont, Pa., plant of United States Gypsum Co. "It has won honorable mention for two successive years," he said. "The mill manufactures kraft paper and converts it into multi-wall plaster and lime bags. Its operation employs 180 people, of whom 40 per cent are women. In the 38 months preceding the closing date of the 1951 contest U.S. Gypsum employees at Oakmont established a record of 1,121,351 man-hours without a reportable injury."

The Kimberly, Wis., mill of Kimberly-Clark Corp. was singled out by Mr. Dowd in his presentation address as still another outstanding example of an effective safety program. "This mill," he declared, "operated 330 consecutive calendar days . . . for a total of 2,964,923 man-hours without a lost-time accident. It established a new Kimberly-Clark record, which was formerly held by the Niagara, Wis., mill at 1,864,027 man-

D. C. EVEREST of Marathon Corp. is honored as a "Pioneer of 1912" at annual Congress Banquet

CERTIFICATE as "Pioneer of 1912" is handed to S. F. Shattuck of Kimberly-Clark by Ned Dearborn

Everest and Shattuck Honored as "Pioneers of 1912"

Two men prominent in the paper industry were honored at the yearly banquet of the National Safety Congress, along with nine other industrialists, for their long interest and support in the safety movement. D. C. Everest, chairman of the board of Marathon Corp., and S. F. Shattuck, director of Kimberly-Clark Corp., were recognized by Ned Dearborn in his annual address as being present at the first National Safety Congress, held in Milwaukee in 1912. Mr. Dearborn is NSC president.

". . . It is not possible to overemphasize," Mr. Dearborn declared, "the contribution to the future welfare and security of America that was made by the pioneers in safety who so valiantly took their stand there in the Pfister Hotel in Milwaukee 40 years ago. . . . We are proud and happy to have some of them with us tonight . . . In honoring them we are, at the same time, honoring all who were there in Milwaukee in 1912 and all the others who, in the early days of the organized safety movement, gave devoted service to the cause of accident prevention . . ."

In presenting a special commemorative certificate to Mr. Everest, Mr. Dearborn declared, "He attended the 1912 Congress as general manager of Marathon Corp. at Rothschild, Wis. He rose up through other positions of responsibility in that company and is now chairman of the board. . . . He is, in truth, one of Wisconsin's outstanding citizens, and has served with distinction in many fields of public service, including membership on the National Safety Council's board of directors."

Honoring Mr. Shattuck, Mr. Dearborn said, "He found it relatively simple to get to the 1912 Congress, having to come only from Neenah, Wis., where he was vice president of Kimberly-Clark Corp. Mr. Shattuck retired from the vice presidency of his company in 1945 but is still a director. He is another of Wisconsin's outstanding public-spirited citizens and has done much for safety, in his company and throughout the state."

The certificates presented to the pioneers read as follows: "From the Fortieth National Safety Congress and Exposition, held in Chicago, October 20-24, 1952, to you who attended the First Cooperative Safety Congress, held in Milwaukee, Wisconsin, September 30-October 5, 1912.

"The Fortieth Congress honors you and all the other 1912 pioneers, who, by organizing and conducting the First Safety Congress with such outstanding success, made a vital and significant contribution to the development of the national safety movement."

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hours. The latter mill won THE PAPER INDUSTRY Major Award for its perfect score in the 1929 Paper Industry Annual Safety Contest."

Rehabilitation

At the second general session three prominent spokesmen for the safety movement in the industry addressed the more than 160 delegates. Leading off was a discussion of rehabilitation through workmen's compensation as practiced in the Province of Ontario. The speaker was D. D. McRae, assistant secretary-treasurer of Ontario-Minnesota Pulp & Paper Co. Ltd., Fort Frances, Ont.

"Today in the Province of Ontario," he declared, "workmen's compensation does not rest upon the willingness of the employer to pay, nor upon his generosity. It is not charity. It is not something given to the workman or his dependents by the employer. Workmen's compensation is an organized attempt to care socially for the burden which industrial accidents has placed upon those who are employed in our modern economic age of high-speed and extensive production, and who suffer risk of death or injury by reason of that employment. Properly then, the burden falls on society."

After briefly reviewing the history and requirements of the Workmen's Compensation Act for the Province of Ontario, Mr. McRae pointed to its comprehensiveness. At the present time, he said, there are about 48,000 employers registered with the Workmen's Compensation Board.

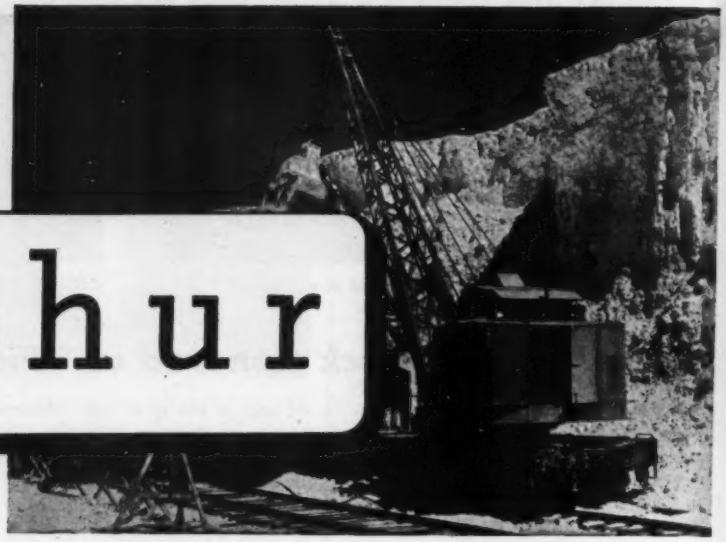
"The prime purpose of the Act," Mr. McRae continued, "is to protect injured workmen, but the employer may also take advantage of coverage if he so desires. When the yearly payroll return is filed with the Board, it is necessary for him to state definitely that he wishes to be covered at a stated salary, which must be no less than $1,200 nor more than $4,000 per year. He thereby puts himself in the same position as a workman in respect to receiving compensation for accidents."

Mr. McRae described the careful records required of all employers participating under the Act, including all expenditures for wages, showing the names of his workmen, their earnings, and the date from which they were employed by him.

The speaker detailed the establishment and growth of the convalescent center operated by the Board at Malton, about 14 miles from Toronto. "By so doing," he said, "the Board has shown that it is anxious to provide the industrial worker injured in the Province with the very best in medical and rehabilitation service.

"Rehabilitation officers direct their thoughts towards eventual return to work and assist in solving any personal problems that may delay recovery. The Board knows from years of experience that the majority will return to useful employment and once again will live full and satisfactory lives in spite of disability. Properly placed, the handicapped prove to be efficient, loyal, and safe workers.

"Much is accomplished by cooperative effort," he concluded, "and doctor, nurse, therapist, and rehabilitation officer must all pull together for the good of the patient. However, in the final analysis, it is the degree of cooperation given by the 450 patients that determines the success of the operation. The man who realizes that what is being done for him speeds his return to work and



Sulphur

Thousands of tons mined daily, but where does it all go?

Did you ever have the misfortune on a steaming, sticky, sultry day to sit it out on a crowded parkway, bumper to bumper, waiting for traffic to clear? No doubt your thoughts were plenty sulphurous but probably not along the lines we have in mind.

We're thinking of the mineral Sulphur and its link with the automobile. Each car accounts for a substantial poundage of Sulphur, some estimates put it at around 25 pounds for the average car. Give or take 5 pounds, it shows that a tremendous tonnage of Sulphur is needed each year to put cars, buses and trucks on the road ready to operate. And don't forget the tire and battery replacements going on every day.

Sulphur enters the automobile picture through the tires, steel sheets, plated and plastic fittings, glass, battery acid and parts, copper tubing and wiring . . . all of which call for the use of Sulphur or its compounds in connection with their manufacture.

Can you wonder that Sulphur goes into industry just about as fast as the sulphur producers of the Gulf Coast Region can get it above ground and cooled preparatory to shipment?

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Sulphur Producing Units: Newgulf, Texas • Moss Bluff, Texas
Spindletop, Texas • Worland, Wyoming

NEW SECTION OFFICERS are (l to r) E. B. Lambton, secretary and membership chairman; A. E. Minor, general chairman; Arthur Carle, vice chairman and program chairman, and Dallas Henry, news letter editor

ANNUAL MEETING of the executive committee was held during the National Safety Congress; at the head of the table is the new general chairman, A. E. Minor, safety supervisor for Ontario-Minnesota Pulp & Paper Co.

reduces his disability will take a keen interest in the program arranged for him."

Fire prevention

Following Mr. McRae's talk, Allen L. Cobb discussed fire prevention at the paper mill. Mr. Cobb, director of safety and fire prevention for Eastman Kodak Co., Rochester, N.Y., discussed first the serious hazard posed by the log pile.

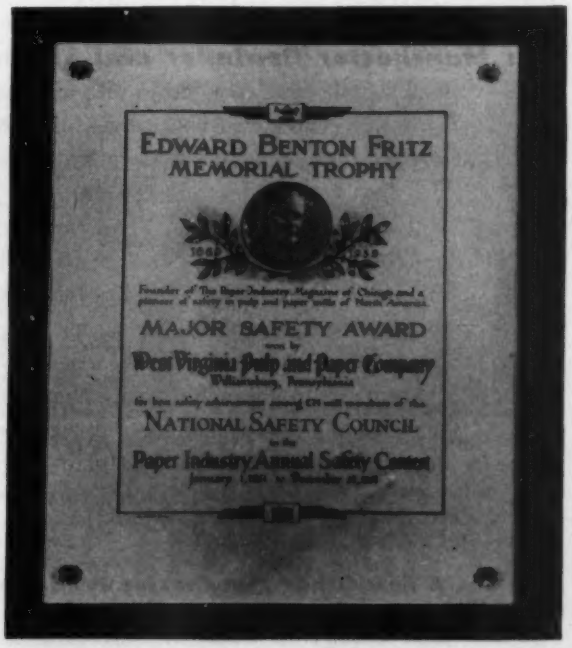
Fire prevention in the woodroom, he said, is principally a problem of housekeeping and policing, as it is in the machine room, where one finds a variety of hazards, such as hot bearings, dust accumulation, broke, etc.

Mr. Cobb concluded his address with a description of proper methods for fighting fire in paper rolls. Since the fire is usually hard to get at, he said, this, too, is a problem of housekeeping and policing. Emphasizing the importance of immediate detection and efficient sprinkler equipment, he also stressed weight and height limits.

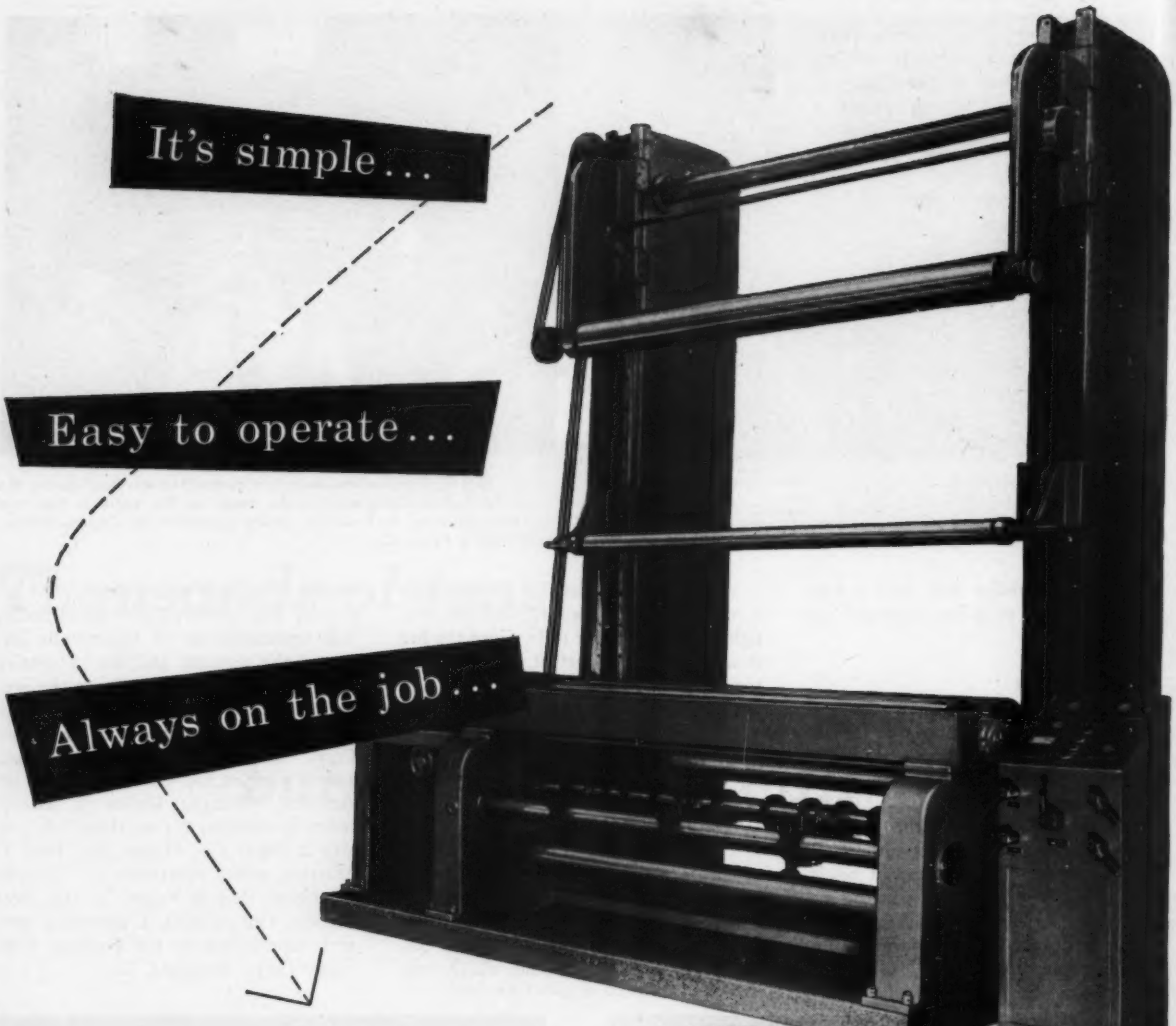
Unusual accidents

The use of slides in the combatting of accidents was clearly demonstrated by R. W. Gray, safety director of Union Bag & Paper Corp., Savannah, Ga. In a roundtable type program, he led a discussion of unusual accidents, which were shown on a large movie screen. The accidents had occurred in various mills, and representatives of those mills discussed the mishaps and the preventive measures taken. Participating in the program were the following: Francis Wagner, director of safety for The Mead Corp., Chillicothe, Ohio; A. O. Vranek, safety director for Container Corp. of America, Chicago; Dallas E. Henry, safety coordinator for Southern Advance Bag & Paper Co., Hodge, La.; Fred T. Morrish, safety supervisor for Ontario-Minnesota Pulp & Paper Co. Ltd., Fort Frances, Ont., and G. J. Bienvenu, general superintendent for Gaylord Container Corp., Bogalusa, La.

WILLIAMSBURG representatives display the Fritz award; they are Ray Orris (r) and F. W. Nash



FRITZ TROPHY, won this year by the Williamsburg, Pa., mill of West Virginia Pulp & Paper Co.



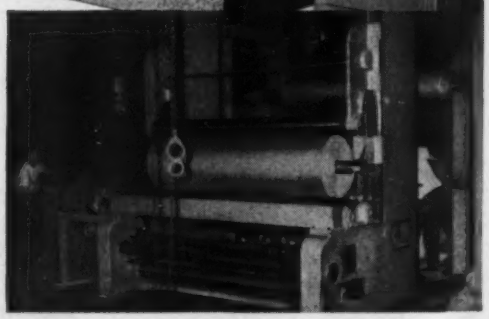
This Manchester Rewinder and Slitter is as simple and easy to operate as your radio set. Note the centralized control feature—*the man at the "console" handles everything* except getting the paper on the winder drum.

It's a designer's dream . . . no gingerbread, no unnecessary working parts to cause trouble and maintenance expense. . . . All of which sums up to uniform tight rolls and clean cut edges with low labor and operating costs for *you*.

Compare the Manchester Rewinder and Slitter with any other machine of its size and you'll see what we mean. We'll be glad to give you additional information applied to your specific needs. Write us.

A Few Other Manchester Products

Drum Winders • Adjustable Shake Motion • Pope Type Reels Paper Machine Drives • Size Presses • Drilled Suction Press Rolls Drilled Suction Drum Rolls • Drilled Suction Couch Rolls • Cylinder Moulds • Complete Fourdrinier • Roll Grinding



Here's a Manchester Rewinder and Slitter in service in a well-known Ohio paper mill. The owners say, "We are well satisfied with our new streamlined unit. It is doing everything you said it would do—and more."

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Roundtable discussions

Programs during the last two afternoons were devoted entirely to six roundtable discussions, in which various paper mill and converting problems were presented for informal discussion. The subjects and presiding officers at each of the meetings were as follows:

Sulfite Pulp Manufacturing: Ora Hazen, safety supervisor for Minnesota & Ontario Paper Co., International Falls, Minn.; *Sulfate Pulp Manufacturing:* D. V. Hill, safety director for The Mead Corp., Kingsport, Tenn.; *Paper Converting*: A. O. Vranek, safety director for Container Corp. of America, Chicago; *Paper Manufacturing*: Francis H. Wagner, director of safety for The Mead Corp., Chillicothe, Ohio; *Pulpwood Logging*: H. H. Jefferson, training officer with the American Pulpwood Association, New York, N.Y., and *Insulation Products*: H. M. Jackson, safety engineer for The Johns-Manville Corp., New York, N.Y.

Executive committee organization

The structure of the 1952-53 paper section executive committee, in addition to the officers listed above, is as follows:

Regional Membership Representatives—*Great Lakes:* E. A. Page, safety supervisor, Kimberly-Clark Corp., Neenah, Wis.; *East:* H. P. Heubner, insurance manager, The Flintkote Co., New York, N.Y.; *South:* C. C. MacPike, safety director, Kraft Paper Division of St. Regis Paper Co., Pensacola, Fla.; *West:* Ernest Dutcher, safety engineer, Pioneer Division of The Flintkote Co., Los Angeles, and *Canada:* Douglas B. Chant, secretary-engineer, Ontario Pulp and Paper Makers' Safety Association, Toronto.

Medical Advisor—Dr. James D. Stark, medical director, Hammermill Paper Co., Erie, Pa.

Statistical Committee—Gordon Lemke, safety engineer, Employers' Mutual Liability Insurance Co., Wausau, Wis. (chairman); R. W. Croucher, safety officer, Minnesota & Ontario Paper Co., International Falls, Minn.; Lambert Louy, safety director, Container Corp. of America, Chicago; George R. Merriman, coordinator of personnel and safety, International Paper Co., Mobile, Ala., and W. H. McLaughlin, director of safety and sanitation, Lily-Tulip Cup Corp., College Point, L.I., N.Y.

Contest Committee—A. Scott Dowd, president, Fritz Publications Inc., Chicago (chairman); J. Fred Berry, personnel manager, Alton Box Board Co., Alton, Ill.; Harley B. Goodrich, maintenance and safety engineer, Strathmore Paper Co., West Springfield, Mass., and James N. Conaway, safety manager, Scott Paper Co., Chester, Pa.

Pulpwood Logging Division—Chairman, John E. Schueler, safety engineer, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

Publications Committee: John C. Mader, safety engineer, Employers' Mutual Liability Insurance Co. of Wisconsin, Iron Wood, Mich. (chairman); Harry H. Jefferson, training officer, American Pulpwood Association, New York, N.Y., and G. K. Eoll, personal manager, Marathon Paper Mills of Canada Ltd., Port Arthur, Ont.

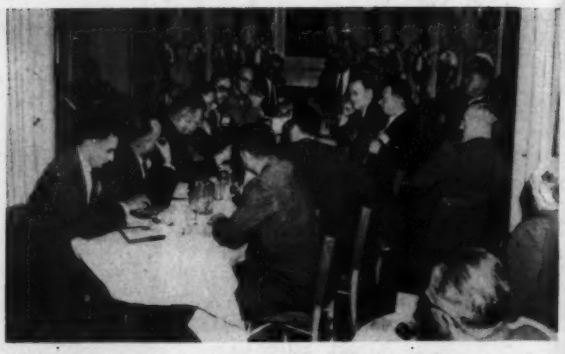
Visual Aids Committee: Fred T. Morrish, safety supervisor, The Ontario-Minnesota Pulp & Paper Co. Ltd., Fort Frances, Ont. (chairman); John Currie,

HEAD TABLE at the annual luncheon; officials of the section are (l to r): E. B. Lambton, secretary and membership chairman; Arthur Carle, vice chairman and program chairman; H. B. Goodrich, retiring general chairman; A. E. Minor, new chairman; C. L. R. Dougherty, 1950-51 general chairman; Dan Adair, NSC staff representative, and Dallas Henry, news letter editor

KEYNOTING the opening session was G. W. E. Nicholson, Union Bag & Paper vice president; others shown are (l to r) C. L. R. Dougherty, 1950-51 section chairman; H. B. Goodrich, retiring chairman, and A. E. Minor, new chairman

KIMBERLY-CLARK delegation gathers for annual safety meeting during Congress

SULFITE PULP roundtable; Ora Hazen of Minnestoa & Ontario was chairman



SULFATE PULP roundtable; D. V. Hill of The Mead Corp. was chairman of the discussion

PAPER MANUFACTURING roundtable; leading the discussion was F. H. Wagner, The Mead Corp.

PAPER CONVERTING roundtable; A. O. Vranek of Container Corp. served as chairman

personnel superintendent, Great Lakes Paper Co. Ltd., Fort William, Ont., and J. C. Rodgerson, safety director, Brown Co., Berlin, N.H.

Pulp Manufacturing Division—Chairman, Fred O. Soughton, service and safety supervisor, LongLac Pulp & Paper Co. Ltd., Terrace Bay, Ont.

Publications Committee: D. V. Hill, safety director, The Mead Corp., Kingsport, Tenn. (chairman); A. S. Cook, secretary manager, Quebec Pulp and Paper Safety Association Inc., Quebec, P. Q.; W. S. Mossman, safety supervisor, Great Lakes Paper Mills Ltd., Fort William, Ont., and G. A. Okerlund, safety director, Puget Sound Pulp & Timber Co., Bellingham, Wash.

Visual Aids Committee: Marion L. Hodges, safety director, West Virginia Pulp & Paper Co., North Charleston, S.C. (chairman); E. J. Marquardt, safety director, National Container Corp., Tomahawk, Wis.; George S. Nelson, claims and safety manager, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., and Russell Bell, safety director, Crossett Paper Mills, Crossett, Ark.

Paper Manufacturing Division—Chairman, Francis H. Wagner, director of safety, The Mead Corp., Chillicothe, Ohio.

Publications Committee: Robert K. Meredith, safety director, West Virginia Pulp & Paper Co., Tyrone, Pa. (chairman); Otto Sherman, safety supervisor, Mill Division of Gaylord Container Corp., Bogalusa, La.; C. R. Johnston, personnel and safety director, Cornell Paperboard Products Co., Cornell, Wis., and Ross B. Welsh, safety supervisor, P. H. Glatfelter Co., Spring Grove, Pa.

Visual Aids Committee: James N. Conaway, safety director, Scott Paper Co., Chester, Pa., (chairman); Howard H. Dyke, safety and personnel, International Paper Co., Glens Falls, N.Y.; Robert J. Gell, staff assistant, Paper Mills Division of Eastman Kodak Co., Kodak Park Works, Rochester, N.Y.; G. Russell Leonhard, director of safety, Peterson Parchment Co., Bristol, Pa., and John C. Keegan, safety supervisor, National Container Corp., Jacksonville, Fla.

Paper Converting Division—Chairman, Robert W. Gray, safety director, Union Bag & Paper Corp., Savannah, Georgia.

Bag Manufacturing Committee: R. G. Belknap, personnel manager, Bemis Bros. Bag Co., East Pepperell, Mass. (chairman); Martin Maney, director of training, St. Regis Paper Co., Pensacola, Fla.

Box Manufacturing Committee: Anthony O. Vranek, safety director, Container Corp. of America, Chicago (chairman); G. J. Bienvenu, general superintendent, Container Division of Gaylord Container Corp., Bogalusa, La.

Roofing Manufacturing Committee: Hugh Jackson, manager of safety and training, The Johns-Manville Corp., New York, N.Y. (chairman); Thomas J. Tobin, safety director, Lloyd A. Fry Roofing Co., Summit, Ill.; Frederick A. Schulze, director of industrial relations, The Ruberoid Co., Joliet, Ill., and A. W. Smith, personnel and service manager, Bird & Son Inc., East Walpole, Mass.

Insulation Manufacturing Committee: Gordon Allen, personnel manager, Wood Conversion Co., Cloquet, Minn. (chairman); Amos S. Kean, safety director, Armstrong Cork Co., Lancaster, Pa.

Specialties Manufacturing Committee: Vincent P. Coulon, safety director, The Sealright Co. Inc., Fulton, N.Y. (chairman); A. J. Homblette, safety supervisor, Kimberly-Clark Corp., Neenah, Wis., and W. L. Lauer, personnel director, Dixie Cup Co., Easton, Pa.

During the Congress it was determined that the 1953 gathering will be in Chicago October 19-23.

The spring meeting of the Pulp and Paper Section executive committee will be in Columbus, Ohio, during the All-Ohio Safety Congress April 21-23. An invitation has been given to visit The Mead Corp. mill in Chillicothe.

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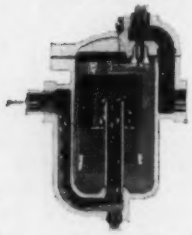


Better Performance,
Low First Cost,
Low Maintenance.

USE of an individual Armstrong trap on each paper machine dryer insures quick removal of condensate, air and incondensible gases at any pressure, provides higher operating temperatures. The cost is far less than for more elaborate systems and the special new Armstrong paper machine trap gives you long life with low maintenance. Quality is guaranteed.

BULLETIN NO. 205 ➧

. . . explains why you can depend on Armstrong paper machine trap performance. Send for a copy.

INDIVIDUAL DRYER TEMPERATURE CONTROL FOR PAPER MACHINES

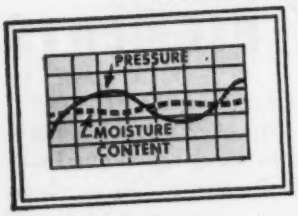
Automatically maintains dryer temperature at any point from 100°F to 250°F

THIS control mixes air with steam to maintain relatively cool wet end dryers. This prevents the sheet from sticking to the dryer surface and avoids curl or cockle due to overdrying on one side. The rest of the machine operates at maximum temperature.

BULLETIN NO. 187 ➧

. . . explains the Control and its advantages. Write for a free copy.

MOISTURE CONTROL SYSTEM FOR PAPER MACHINES



Automatically maintains very uniform sheet moisture content at any desired percent

THIS control maintains much more accurate sheet moisture content than is possible with hand control or constant steam pressure. It detects moisture content changes as the sheet passes over an "indicating dryer" and then varies steam pressure on the entire machine to compensate for the moisture variation.

BULLETIN NO. 196 ➧

. . . tells how the Moisture Control works, explains the specially designed components, lists the advantages. Send for your copy.

STEAM HUMIDIFIERS FOR PAPER STORAGE

Automatically adds moisture to maintain any desired relative humidity

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. . . discusses relative humidity, gives data and prices on Armstrong Humidifiers, explains hookups, selection, etc. Send for your copy.

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The Paper Industry Association News

EXECUTIVE COUNCIL meeting held during the Seventh Tappi Engineering Conference at Chicago; those pictured above are (l to r): W. F. Hathaway, Kalamazoo Vegetable Parchment Co.; W. D. Harrison, Riegel Paper Corp.; R. S. Macdonald, secretary-treasurer of Tappi; K. P. Geohegan, Howard Paper Mills, Inc. (president); G. H. Pringle, The Mead Corp. (vice president); J. R. Lientz, Union Bag & Paper Corp., and R. P. Price, Hammermill Paper Co.

Accident Prevention an Engineering Problem, Tappi Conference Told

"The engineering approach to accident prevention is basically one of hazard elimination," said Professor George W. Harper of the University of Illinois at the Seventh TAPPI Engineering Conference held at the Morrison Hotel, Chicago, on October 13-16.

The engineering approach to accident prevention has suffered considerably through the widespread acceptance of the over-emphasized 80:20 accident-cause ratio which attributes 80 to 85 per cent of all industrial accidents to human failure and the remaining 15 to 20 per cent to unsafe plant conditions. This has frequently led to putting the emphasis on a training, testing, and psychological approach rather than on the elimination of physical hazards.

Professor Harper contends that very few, if any, industrial injuries can be attributed to any one cause alone. Accidents usually occur as a result of a combination of causes attributed to both unsafe acts on the part of the employees and unsafe plant conditions. Accident prevention is an engineering problem, and the engineer's approach is to consider facts. The engineer's primary concern must be the elimination of physical hazards. Following that, he will need all the safety training and safety promotion programs that industry is willing and capable of putting into effect.

Apart from relegating the elimination of physical hazards to a place of secondary importance, or ignoring it altogether, the acceptance of the accident-cause ratio has also produced an attitude, among both management and employees, of looking at the safety program primarily as a means of assisting employee relationships. This has frequently resulted in putting the safety program under the direction of men who lack the technical background or engineering awareness required for elimination of physical, mechanical, electrical, and chemical hazards.

"More engineers are needed in accident prevention work. Accident prevention must begin on the drawing board. It must enter in the initial planning, in all development phases, in all new construction as well as repair and remodeling work," concluded Professor Harper.

Rules for steam blast coil installation

Improper installation is the cause for most trouble encountered with steam coils, said Richard D. Lubinsky, The Trane Company, LaCrosse, Wisconsin. He outlined two fundamental rules which must be followed when installing steam blast coils on industrial applications: (1) Air must be thoroughly vented from heat transfer equipment, and (2) condensate must drain freely into return lines.

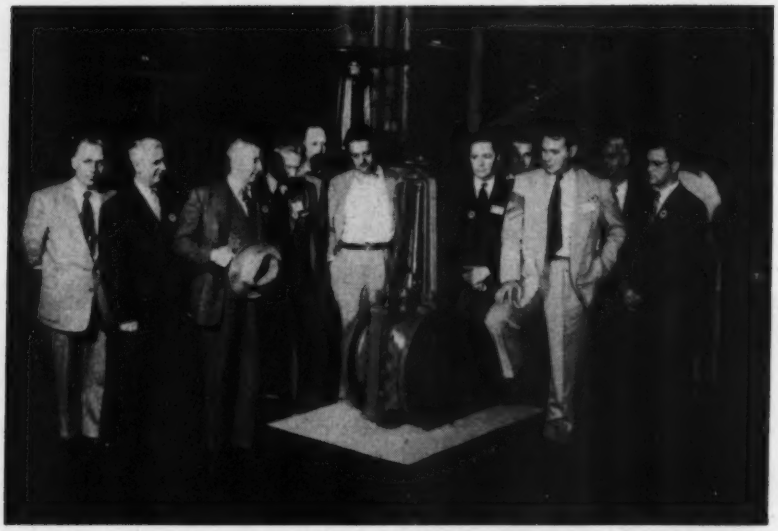
Air, if not removed, will lower heat transfer capacity, and the presence of condensate in the tubes is one of the greatest causes of excessive corrosion in heat transfer surface. Tube rupture due to freezing, excessive water hammer, and unequal expansion can also result from trapped air and the accumulation of condensate. When installing heat transfer equipment, particular attention should be given to pitch of coil, size, type and number of traps required, type of coil, selection of controls, and expansion room for tubes.

Although a carefully engineered installation of steam coils may cost slightly more, it will prove economical in the long run, the speaker concluded.

J. D. Yoder, Vice-President of the Permutit Company, New York, N.Y., discussed the hot-lime zeolite treatment and the demineralization of water for boiler feed makeup. Because of the high makeup and relatively high boiler pressure, good treatment of makeup water is important to protect boilers and turbines from scale deposits. During recent years, the speaker stated, methods of boiler treatment have greatly improved and are available for the most exacting needs. Particular advantages of each type of treatment were listed, as well as comparative treatment costs and costs of chemicals discussed.

F. X. Gilg, The Babcock & Wilcox Company, described a water tube type packaged steam generator, for use in the paper industry. Low fuel costs, low maintenance and operating costs, compactness, portability, simplicity, reliability, and safety in operation are considerations that make the packaged steam generators suited for the paper industry, especially sizes that generate up to 2,800 pounds steam per hour at moderate pressures of 250 psi.

Results of digester corrosion measurements obtained by the use of the Audigage thickness tester were presented by Nicholas Shoumatoff of the West Vir-



INSPECTING A 16-INCH PULP STOCK VALVE at the Chicago works of Crane Co., Tappi members who attended the Seventh Engineering Conference are (l to r): W. Lyle Borst, Power Service Corp., Minneapolis; Carl W. Ziegenbusch, The Mead Corp., Chillicothe, Ohio; Alfred S. Oliver, Minnesota & Ontario Paper Co., International Falls, Minn.; George S. Weinman, Bloomer Bros. Co., Newark, N. Y.; P. E. Fuller, The Mead Corp., Chillicothe, Ohio; Leon E. Savage, Small Defense Plants Administration; W. E. Riley, Record Foundry & Machine Co., Livermore Falls, Maine; J. Wisniewski, Link-Belt Co., Houston, Texas; A. A. Peterson, Buckeye Cotton Oil Co., Memphis, Tenn.; Russell G. Seip, St. Regis Paper Co., Pensacola, Fla., and Thomas A. Feazel, Buckeye Cotton Oil Co., Memphis

ginia Pulp and Paper Company. The results showed that maximum corrosion rates were found near the knuckle section of the tophead, giving it an estimated remaining service life of three years. Appreciably lower corrosion rates and corresponding greater life expectancy were observed above and below the critical knuckle section.

R. S. Peoples and G. L. Ericson, Battelle Memorial Institute, presented the results of a study based on replies to a questionnaire sent to 63 pulp mills on corrosion problems in the industry. This study revealed that digesters installed during the last ten years were significantly more susceptible to corrosion. Thus, 24 per cent of the digesters installed during the last ten years showed corrosion rates of over 100 mills per year, while practically 100 per cent of those in operation prior to this time showed corrosion rates of less than 50 mills per year. It was not possible to decide from the submitted data whether the observed trend was due to (1) changes in operational and processing procedures, (2) type and quality of the steel in the digesters, or (3) as yet unidentified variables.

Press section load requirements

R. R. Baker, Westinghouse Electric Corporation, reported recommendations of the TAPPI Electrical Engineering Committee in connection with power requirements and operating conditions of various press sections. The following modifications and corrections are recommended for the TAPPI Data Sheets:

(1) the NRL constant on the main press for all paper and board formation should be calculated as follows: NRL constant $= 0.011 + 0.004 \times P/100$, where P is the applied nip pressure in pounds per linear inch;

(2) the RDC constant per pair of rolls should retain its present value of 0.03 up to a maximum nip of 300 pounds per linear inch;

(3) the RDC constant, for top press roll only, should retain the present value of 0.010.

On main presses, when used for pulp sheet formation, it is recommended that new constants be added to the present data as follows:

(1) NRL constant $= 0.025 + 0.00275 \times P/100$;

(2) RDC constant per pair of rolls use 0.045 up to a maximum nip pressure of 900 pounds per linear inch;

(3) RDC constant, for top roll only, use 0.015.

The power data obtained on the smoothing press section indicate that the NRL constant per pair of rolls should be reduced to 0.0070 instead of 0.0090 and that the RDC constant of 0.0120 should be retained.

New stock shear tester designed

Professors Lyle C. Jenness and Richard E. Durst, University of Maine, described the installation of a pipe system for the measurement of pressure drops due to pipe friction that accompany the flow of pulp stock under various conditions. The system includes a stock mixer, a high consistency pump, a Hydrapulper, and test gages for measuring pressures. This equipment was consigned to the University by industrial organizations among which are the Armco Steel Corporation, Allis-Chalmers Manufacturing Company, Black-Clawson-Shartle-Dilts, and Eastman Kodak. The paper also described a pulp stock shear tester designed and constructed by two former Maine students, Robert Perry and John McClure. The shear tester is a large scale viscosimeter with a rotating member which delivers torque through the stock to the wall of the stock containing cup, which is suspended on ball bearings and is free to rotate. The cup rotation is restrained by balancing weights, the mass of which is a measure of the torque delivered to the cup by the stock. The results show that for any given stock of consistencies below 1.0 per cent, the shear stress is nearly independent of rotor speed. Although the data are incomplete for higher consistencies, indications are that the shear stress is a function of consistency and velocity for any given stock.

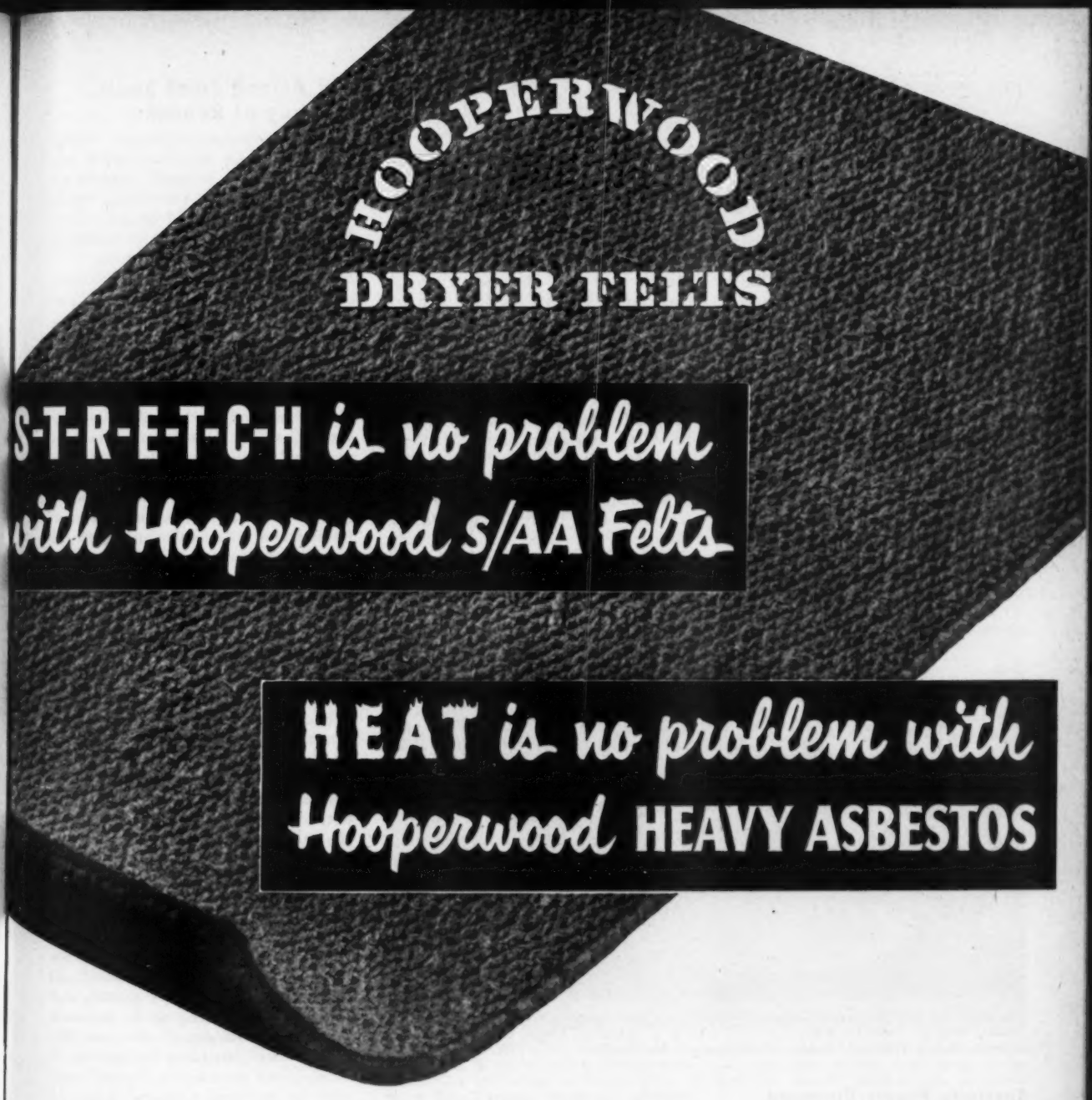
Flow in nozzle type slices

Results of an investigation of the pressure of the flow against a straight converging top slice plate were reported by J. B. Gough, The Mead Corporation.

A negative pressure was found to exist at the inclined top slice surface for a jet or approximate wire speed of 300 ft. per minute, if in contact with the liquid for any greater distance than approximately six inches from the lip edge, when the angle of convergence is 50° or more, or for any greater distance than nine inches when this angle is 30° or more. For speeds of 600 ft. per minute or more, no such negative pressure will exist, even at distances of 24 in. from the lip, unless the angle of convergence exceeds 50°, or unless a sealed pond is under a sufficient vacuum.

Possible bad effects of these negative pressures and air entrainment on the smoothness and the uniformity of the jet from the slice orifice and on the resulting formation and sheet quality were discussed.

The method for determining sheet making rates in cylinder machines was described by Charles F. Payne and William E. Guthrie, Eastman Kodak Company. The authors used an apparatus that can be calibrated to duplicate the drainage rate that exists on the particular machine under study. The cylinder machine's changing papermaking head conditions are automatically reproduced over a wire section identical to a similar area on the machine. The white water drained through the facsimile mold section is collected and measured in the calibrated U-tube which is enclosed in an air-tight windowed chamber. The drainage rate is determined by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taking simultaneous motion pictures of the U-tube and a high speed clock. The motion pictures are examined, one frame at a time, and the total volume of white water in the U-tube is plotted against time on the clock to obtain a curve of the drainage rate. From the drainage curve, the rate of sheet buildup can be determined for any point in the cylinders' travel.

Jesse A. Jackson, St. Regis Kraft Corporation, explained a method which enables the designer to compare the characteristics of two or more vats of similar design and furnish data that give an overall picture of what is happening to the fibers at each point of their progress through the machine.

Other papers presented at the meeting listed care and maintenance rules of rubber covered rolls in the pulp and paper industry for maximum operating performance, by E. L. Lockman, United States Rubber Company. The preparation, handling, and transportation of pulpwood east of the Rockies was described by J. A. Holekamp, American Pulpwood Association. A. J. Cirrito, Lukens Steel Company, discussed the evaluation of drying concepts.

National Production Authority's role for the control of materials and for the planned expansion of industry during the time of defense buildup was described by Allen Hyer, Bagley & Sewall Company. E. F. Langenwalter, General Electric Company, discussed electrical operating problems associated with relaying tie operation between utilities and paper mills, and discussed reclosing speeds of breakers and various types of relays for sensing electrical disturbances.

Electrical cable specifications for the pulp and paper industry were presented by A. O. Mortenson of the St. Regis Paper Company. These recommendations were made on the basis of replies to a questionnaire received, recorded—separately and jointly—by TAPPI, the Insulated Power Cable Engineers' Association, and the Canadian Pulp and Paper Association.

SPEAKERS AT EMPIRE STATE Tappi's Metropolitan District meeting are pictured with Chet Landes, program chairman; they are (l to r) George C. Borden of Riegel, Lawrence S. Tobias of International, Walter T. Cusack of Aldine, and Mr. Landes

Specialty Papers Discussed at Empire State Tappi

A discussion of the development of specialty papers to capture new markets was featured at the October 14 dinner meeting of the Metropolitan District of Empire State Tappi. About 80 members and guests attended the gathering, which was held at Fraunces Tavern, New York, N.Y.

During the panel discussion Dr. George C. Borden, technical director of Riegel Paper Co., described in detail how his firm proceeded with the development of the many specialties (over 600) which it manufactures and the problems frequently involved. Walter T. Cusack, vice president of Aldine Paper Co., amplified the subject by defining the wide scope included under the heading "specialty papers" and made particular reference to the years of research required for developing a bag for vacuum cleaners. Lawrence S. Tobias, sales engineer for International Paper Co., told of the development and converting of twisting papers. All the speakers emphasized the growing potentialities for paper specialties, but pointed out that frequently it is easier to develop a new sheet than to find a market for it.

The section chairman, Paul L. Hagerty, introduced the officers: Ralph Kumler, vice chairman, and John Doherty, secretary-treasurer. Patrick C. Palmaccio is membership chairman, and William R. Willets is publicity chairman. Members-at-large of the advisory committee are Lew R. Ayres, Edward F. Boyle, and John L. Rice.

300 Attend Joint Supts. Meeting at Roanoke

A varied technical program highlighted the joint fall meeting of the Southeastern and Southern divisions of the Superintendents Association, which was held October 8-10 at the Hotel Roanoke in Roanoke, Va. Approximately 300 members and guests attended.

Principal speaker at the joint luncheon on the first day was Andrew J. Miller Jr., assistant director of industrial relations for The Mead Corp. at Chillicothe, Ohio. He stressed the need for preserving our way of doing business; said that the attention of the world is focused on us, and related that our standard of living is second to none in the world today. . . . Three things, Mr. Miller concluded, have been responsible for the position of this country in world affairs, namely: our founding fathers' fundamental belief in God, our political freedom, and our economic freedom. He was introduced by Howard E. Wehr, division manager for Mead at Harriman, Tenn.

Financing

"Financing a Business" was discussed by Edward B. Horner of Scott, Horner & Mason, Lynchburg, Va., at the luncheon on the second day. He commented on the nature of the investment banking industry. In part, he stated that the investment banking business is a necessary part of the growth and development of the economic life of America; that it is that business which goes out and finds the billions of dollars owned by the American people and channels that money through various types of securities to build factories, buy machinery, and furnish needed working capital for the many industries of the nation, and that the business will fill a growing and essential need so long as we maintain our system of freedom of enterprise. Mr. Horner was introduced by Aubrey T. Taylor, vice president and plant manager for National Container Corp. of Virginia at Big Island.

Technical papers

Chairman of the opening technical session was Charles McCarthy of Southern Paperboard Corp., Port Wentworth, Ga., third vice chairman of the Southern Division. Papers presented were: "Quality Control in Papermaking" by Erving W. Rasmussen of Scott Paper Co.; "Current Appraisal of Alkaline Digester Corrosion Problems" by H. O. Teeple of International Nickel Co. Inc., and "Personnel Selection Must be Realistic" by Rex Parrott of Sonoco Products Co.

A vacuum discussion panel was featured in the second session, with Clyde Jones of Ecusta Paper Corp., Pisgah

Forest, N.C., as chairman. Members of the panel were Charles P. Spadling of Beloit Iron Works (moderator); Jack Hayes of National Container Corp., Jacksonville, Fla.; J. A. McDermott of St. Regis Paper Co., Jacksonville; Carl Clark of Clark & Vacario Co., Bronxville, N.Y., and D. L. Dowling of Roots-Connersville Blower Co., Connersville, Ind.

Concluding the session was an address by Harry D. Sayre, president of the United Paperworkers of America, Washington, D.C. He said in part that there should be more and greater participation in labor relations by production representatives of management; that, regardless of vast technical knowledge, no production manager can now be a complete success unless he knows how to work with men and prevail upon them to work with him, and that labor experts hired by major companies today, personnel directors, lawyers and so on, have a record of causing more strikes, needless disputes and senseless arguments than smaller companies that combine production with labor problems.

Two technical sessions were staged on the final day. Papers presented at that time included "The Hydroflyte Fourdrinier" by Jack Buechler of The Black-Clawson Co., Hamilton, Ohio; "The Psychology of Avoidable Industrial Accidents" by Gerhard K. Cotts, M.D., Lynchburg, Va.; "Development in Cylinder Machine Operation" by James J. Harrison of Michigan Carton Co., Battle Creek; "Bleached Semichemical Pulping" by C. William Converse of Sprout Waldron & Co. Inc., Muncy, Pa.; "Vacuum and Pick-up Felt Transfer from Wire to Press Section" by R. W. Burnett of Crossett Paper Mills, Crossett, Ark.; "Oliver Ahlfors Screen" by T. B. Calhoun of Oliver United Filters Inc., New York, N.Y., and "A Study of Recovery Boiler Cleanings" by Sam Walleze of Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa.

New officers

At the business meetings of the Southeastern and Southern divisions the following officers were elected for the 1952-53 season:

For the Southeastern Division—Vinson K. Shannon, The Mead Corp., Lynchburg, Va., chairman; Clyde G. Jones, Ecusta Paper Corp., Pisgah Forest, N.C., first vice chairman; T. R. Barnes, Champion Paper & Fibre Co., Canton, N.C., second vice chairman; Robert B. White, Sonoco Products Co., Hartsville, S.C., third vice president, and M. L. Boinest Jr., Albemarle Paper Mfg. Co., Richmond, Va., secretary-treasurer.

For the Southern Division—Tom S. Coldeway, St. Joe Paper Co., Port St. Joe, Fla., chairman; R. W. Burnett, Crossett Paper Mills, Crossett, Ark., first vice chairman; Charles McCarthy, Southern Paperboard Corp., Port Wentworth, Ga., second vice chairman; C. A. Barlow, Gulf States Paper Corp., Tuscaloosa, Ala., third vice chairman, and L. L. Griffiths Jr., Draper Bros. Co., Canton, Mass., industrial affiliate representative.

Kraft Export Association Organized in New York

The Kraft Products Manufacturers Export Association has filed papers with the Federal Trade Commission under the Export Trade Act (Webb-Pomerene Law) as an export trade association for manufacturers of kraft paper, tall oil, and tall oil derivatives.

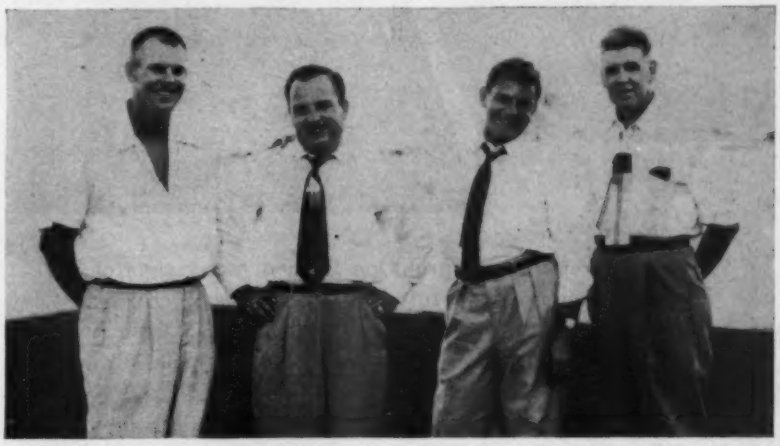
Members of the association include Albemarle Paper Mfg. Co., Arizona Chemical Co., Camp Mfg. Co. Inc., International Paper Co., St. Regis Paper Co., Union Bag & Paper Corp., Gilman Paper Co., Hudson Pulp & Paper Co., and Hollingsworth & Whitney Co. Offices are to be at 521 Fifth Ave., New York, N.Y.

Officers are W. C. Shorter of Camp Mfg. Co. Inc., president; Leonard Doyle of Union Bag & Paper, vice president, and Israel B. Oseas, counsel to the association, secretary-treasurer.

Student Award Highlights Northeastern Supts. Meeting

Carl D. Perkins of Bucksport, Maine, a student at the University of Maine, was awarded a check for $200 at the fall meeting of the Northeastern Division of the Superintendents Association, which was held at Poland Spring. Mr. Perkins is one of three recipients of the Fred C. Boyce Student Award, presented annually by the national association for achievement. The presentation was made by Albert E. Bachman of Missisquoi Corp., Sheldon Springs, Vt., fifth vice president of the national group.

During the meeting Frank B. Harlow of Penobscot Chemical Fibre Co., Great Works, Maine, was elected 1952-53 chairman. Elected with him were Harvey H. Wilson, Ryegate Paper Co., East Ryegate, Vt., first vice chairman; Rudolph T. Greep, S. D. Warren Co., Cumberland Mills, Maine, second vice



FIRST FOURSOME OUT at the Miami Valley Superintendents golf tournament included (l to r) R. S. Ely of Howell Electric Motors Co. (low gross winner); Neal Bangs of Fox Paper Co.; W. LePage of Excello Paper Products Co., and R. Donohoo, also of Excello

Installation of Officers, Golf Featured at Miami Supts.

The first meeting of the Miami Valley Division of the Superintendents Association was highlighted by the installation of officers and a blind bogey golf tournament. The gathering was held September 12 at the Elks Country Club in Hamilton, Ohio.

Presiding at the installation was Homer Latimer of Champion Paper & Fibre Co., Hamilton, a past president of the national association. The new officers are Bernard L. Merriss of Oxford Miami Paper Co., chairman; George Lydick of Beckett Paper Co., first vice chairman; Dean Newell of Philip Carey Mfg. Co., second vice president, and James Ozias of Oxford Miami, secretary-treasurer.

E. H. Bindley of Cheney Pulp & Paper Co., the retiring chairman, was presented with a past chairman's certificate for the work he did for the Division during the 1951-52 season. Mr. Latimer made the presentation.

The golf tournament was sponsored by The Black-Clawson Co. of Hamilton. Rudy Kutter, vice president and sales manager of the firm, awarded the prizes at the evening meeting. In doing so he expressed appreciation for the fine turnout for the tournament and for the privilege of his firm of participating. The dinner meeting was attended by 176 members and guests.

chairman; James H. Snyder, St. Regis Paper Co., Bucksport, Maine, third vice chairman, and Mrs. Marian Stewart, Lincoln, N.H., secretary-treasurer.

Eastern District, Empire State Tappi Meets

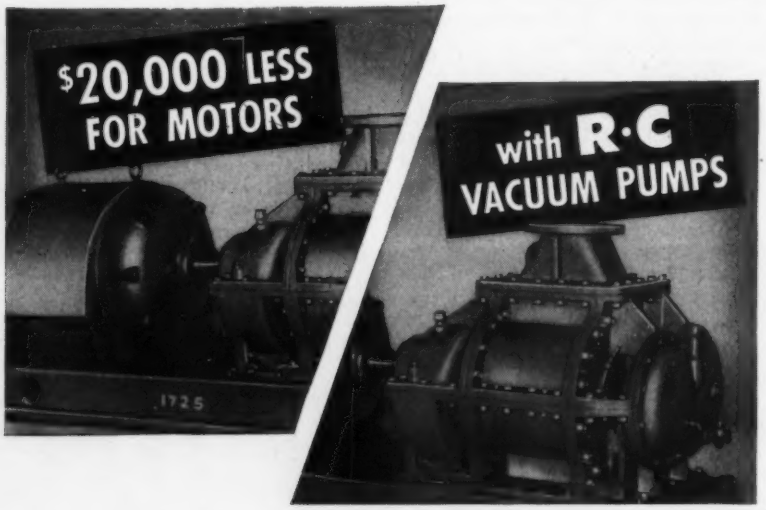
"Consistency Control and Measurement" was the topic of a panel discussion staged by the Eastern District of Empire State Tappi October 16 at Glens Falls, N.Y.

E. J. Trimbey of Trimbey Machine Works opened the session with a history of the development of the first consistency regulator, which was put on the market in 1916. He was followed by Ray DeZurik, chief engineer for DeZurik Shower Co., Sartell, Minn.; A. J. Sloan of Pandia Inc., New York, N.Y., and Arthur Landesman, pulp and paper application engineer with Fischer & Porter Co., Hatboro, Pa. The discussion period was conducted by R. E. March, president of the Eastern District.

New York-Canadian Supts. Elect

Officers of the New York-Canadian Division of the Superintendents Association for the 1952-53 season were elected recently at a meeting at the Saranac Inn, Upper Saranac Lake, N.Y.

They include C. B. Davies, E. B. Eddy Co. Ltd., Hull, Que., chairman; R. E. Grey, Gotham Paper Mills Inc., Battenville, N.Y., first vice chairman; George S. Carroll, Newton Falls Paper Mill, Newton Falls, N.Y., second vice chairman; J. E. Carruthers, Interlake Tissue Mills Co. Ltd., Merriton, Ont., third vice chairman; Mun Bishop, Hercules Powder Co. of Canada, secretary; B. Powers, E. B. Eddy Co. Ltd., treasurer, and Robert Smallian, The Capitol Wire Cloth & Mfg. Co. Ltd., Ottawa, Ont., affiliate representative.



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Coming Events

TAPPI meetings

Nov. 20-21—Corrugated Containers Conference, Schroeder Hotel, Milwaukee.

Nov. 20—Empire State Section (Eastern District), Milfrank's Restaurant, Glens Falls, N.Y.

Nov. 21—Lake Erie Section, Cleveland.

Jan. 13—Pacific Section, Seattle.

Feb. 16-19—Annual meeting, Commodore Hotel, New York, N.Y.

American Pulp & Paper Mill Superintendents Association meetings

Nov. 18—Miami Valley Division (joint meeting with the Ohio Section of Tappi), Middletown, Ohio.

Nov. 20—Michigan Division, Hotel Harris, Kalamazoo.

Dec. 18—Michigan Division, Hotel Harris, Kalamazoo.

Jan. 15—Michigan Division, Hotel Harris, Kalamazoo.

Jan. 22—Miami Valley Division, to be announced.

June 9-11—National meeting, Atlanta-Biltmore Hotel, Atlanta, Ga.

Other meetings

Dec. 1-6—Twentieth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York, N.Y.

Dec. 4-10—First Technical Conference of the Research and Engineering Council of the Graphic Arts Industry, Palmer House, Chicago.

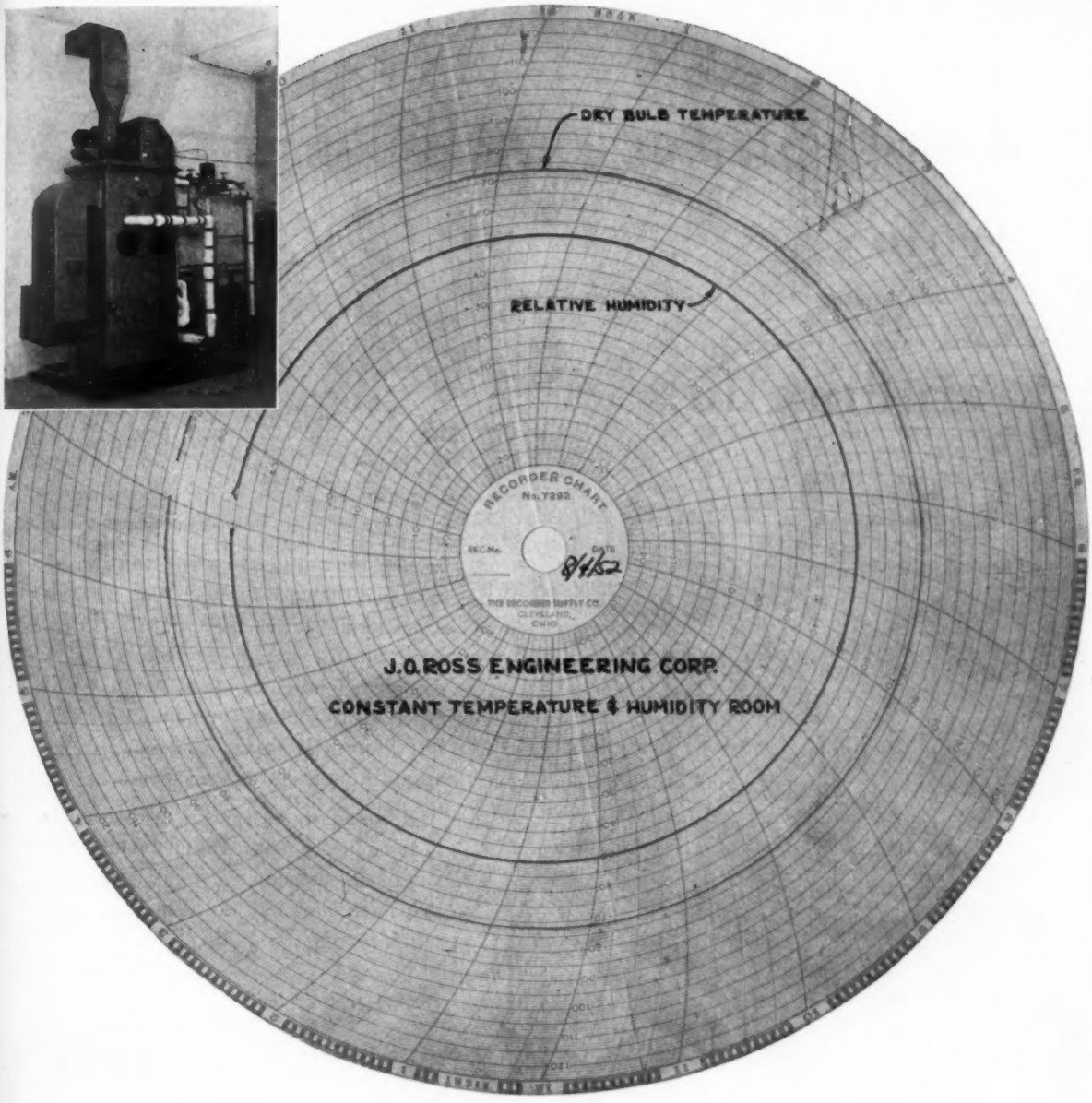
Dec. 7-10—American Institute of Chemical Engineers, annual meeting, Cleveland Hotel, Cleveland.

Jan. 19-22—Plant Maintenance Conference, Public Auditorium, Cleveland.

Jan. 26-30—Dr. John Gaillard Seminar on Industrial Standardization, Engineering Societies Building, New York, N.Y.

Jan. 28-30—CPPA Technical Section, Mount Royal Hotel, Montreal.

Feb. 15-20—APPA, annual meeting, Waldorf-Astoria Hotel, New York, N.Y.



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The Paper Industry Names in the News

Elis Olsson

S. G. Olsson

Elis Olsson Retires as President of Chesapeake

ELIS OLSSON, president and chairman of Chesapeake Corp. of Virginia, West Point, Va., has retired. Succeeding him as president is his son, *STURE G. OLSSON*.

The senior Mr. Olsson remains chairman, to which office he was elected upon his original retirement in September, 1945, when M. C. McDonald became president. Mr. McDonald resigned in January 1952, and Elis Olsson was recalled by the board of directors to fill the vacancy.

Sture Olsson, a graduate of the University of Virginia, spent his summers while in school working in various parts of the company. After graduation he became associated with Sperry Gyroscope Co. as service engineer in the Naval anti-aircraft equipment department. In 1946 he joined Chesapeake as plant engineer at West Point, and was elected vice president in charge of manufacturing in 1951. He was elected executive vice president and general manager in January, 1952, and a director of the corporation in March, 1952.

Kimberly Succeeds Mahler At Kimberly-Clark

ERNST MAHLER, executive vice president of Kimberly-Clark Corp., Neenah, Wis., who retired October 17, has been succeeded by John R. Kimberly.

While he retires after 38 years of service, Mr. Mahler will continue as a director and a consultant. In addition, he has been designated as an alternate member of the corporation's executive committee.

Since joining Kimberly-Clark in 1914, Mr. Mahler has earned recognition from the industry as an outstanding exponent of research in pulp and paper making. He brought the first pulp and paper laboratory into Kimberly-Clark operations. When Brown University awarded him an honorary degree in 1937, the university mentioned his foresight in having founded the Institute of Paper Chemistry and TAPPI. He is also a director of numerous corporations.

Mr. Kimberly joined Kimberly-Clark in 1924 and became assistant general superintendent and a director in 1937. After serving as deputy director of the War Production Board from 1940 to 1943, he returned to become head of Kimberly-Clark sales.

Other changes in personnel include the following: *H. G. BOON*, operating vice president, has been designated vice president of industrial and public relations; *A. G. SHARP* has been elected to succeed Mr. Kimberly as vice president in charge of sales; *JOHN B. CATLIN* has been appointed assistant vice president. In the financial department *J. FREDERICK HUNT*, secretary-treasurer, has retired. Succeeding him are *J. LESLIE SENSENBRENNER*, who has been elected secretary, and *JOHN R. WHITNEY*, who has been elected treasurer. *EDWARD DAVITT*, in addition to continuing as comptroller, has been appointed assistant secretary-treasurer.

Ernst Mahler

Dr. R. E. Kremers

Dr. Roland Kremers Joins Institute of Paper Chemistry

DR. ROLAND E. KREMERS has been appointed research associate in organic chemistry at the Institute of Paper Chemistry, Appleton, Wis.

Dr. Kremers received his A.B. and Ph.D. degrees from the University of Wisconsin where he later held a National Research Council Fellowship in chemistry. Before entering industry, he served as assistant chemist at the Forest Products Laboratory and taught at Wabash College, Vanderbilt University, and Ohio State University. He joined General Foods Corp. as research chemist, and since 1939, has been successively in charge of organic research, assistant manager, and manager of basic research at its Central Laboratories Division.

J. H. Scholl

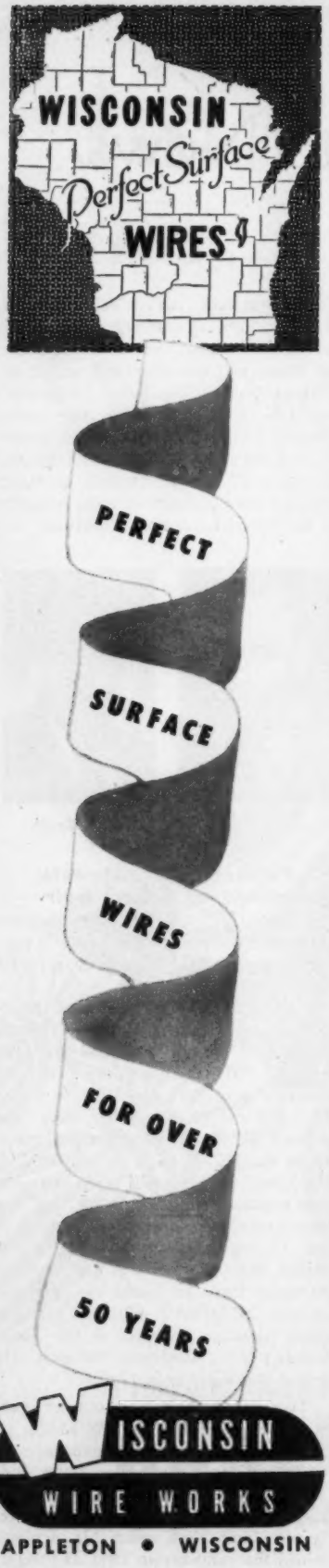
S. R. Bagni

Six Personnel Appointments Announced by Robert Gair

Robert Gair Co. Inc. recently announced the appointment of four personnel managers at various divisions of the firm.

JOHN H. SCHOLL has been made personnel manager at Haverhill, Mass., Boxboard Division. He joined the company in 1945 and had been personnel manager at the Brooklyn division. *STUART R. BAGNI* has been appointed personnel manager at Eastern States Cartons Division, Brooklyn, N.Y. He joined the Haverhill plant last year as a trainee. *CHARLES A. STARK* has been named personnel manager at Boston Corrugated Box Division, Cambridge, Mass. Formerly in the sales department there, he joined the company in 1941. *ARTHUR J. BEILEIN* has been made personnel manager at the Tonawanda, N.Y., Boxboard Division. He joined that division in 1936.

Two additional appointments announced by the firm are: *RUSSELL D. SCRIBNER*, division manager at Thames River, New London, Conn., mill and box shop; and *JAMES C. HOW*, assistant to the manager of industrial relations, New York office. Mr. Scribner joined the company in 1951 as produc-



C. A. Stark

A. J. Beilein

R. D. Scribner

J. C. How

tion manager for the folding carton division. He previously had been in charge of four plants of Shellmar Products Corp. and had spent 15 years in the cellophane division of the DuPont Co. Mr. How, who joined the company in 1943, had been personnel manager at Gair's Boston Corrugated Box Division, Cambridge, Mass.

C-Z Appoints Robert Young Assistant Vice President

ROBERT H. R. YOUNG, vice president of Pacific Mills Ltd., Vancouver, B.C., has been appointed assistant vice president in the manufacturing department of Crown Zellerbach Corp., San Francisco, Calif. His principal responsibilities will be in C-Z converting operations. He will succeed *R. O. YOUNG,* whose retirement, after 46 years of service, is scheduled for December 1.

Mr. Young, a graduate of Oregon State College, joined Pacific Mills Ltd. in 1922 at Ocean Falls, B.C., as a carpenter's helper. In 1935 he was promoted from the position of assistant manager at West Linn to assistant manager at Ocean Falls. In 1941 he became resident manager at Ocean Falls. With Pacific Mills Ltd. expanding he was brought to Vancouver, B.C., in 1946 as manager of manufacturing and was named vice president in charge of manufacturing in 1951.

Brosius Retires as Supt. of Brown Co.'s Riverside Mill

ARTHUR BROSIUS, superintendent of the Riverside mill of Brown Co., retired as of November 1. A native of Carthage, Ind., he came to Brown Co. in 1915 and five years later became superintendent of the Riverside mill. In 1931 he was appointed paper mill superintendent at the Cascade mill, returning to Riverside as superintendent in 1939. Mr. Brosius served as chairman of the Eastern Division of the American Pulp & Paper Mill Superintendents Association in 1950.

Champion Paper Names Chilson Technical Assistant

WARREN A. CHILSON has been appointed a technical assistant to the director of production at Champion Paper & Fibre Co. He will be stationed in the company's general office at Hamilton, Ohio.

A native of New England, Mr. Chilson received his degree in chemical engineering at Northwestern University. His past experience includes work at Forest Products Laboratory and such previous positions as general superintendent and plant manager, Cellufoam Corp.; manager of sales service, Hooker Electrochemical Co.; sales executive, Sandy Hill Iron & Brass; advisor to the president, Northern Paper Mills; and sales manager, Curlator Corp.

W. A. Chilson

L. J. Robinson

Robinson Retires From Lockport Felt Co.

LESTER J. ROBINSON has retired as administrative and technical consultant of Lockport Felt Co., Newfane, N.Y., after 38 years of service. He started as an understudy to his father, the late Joseph Robinson, who was then plant superintendent. He was made assistant superintendent in 1918 and became superintendent of the mill in 1923, a position which he held until 1934 when, in addition to the superintendency, he was made assistant plant manager. Mr. Robinson became plant manager in 1945 at the time of his father's retirement. In 1951 he was transferred to the administrative staff. He has also acted as a director of the company for a number of years.

J. D. ZELLERBACH, president of Crown Zellerbach Corp., San Francisco, Calif., presented service pins and citations to 83 employees of the Carthage, N.Y., division at the company's annual award banquet. *FRED BINGLE,* oldest employee in years of service, received a pin commemorating his 45 years of employment by the corporation.

Dr. H. F. Lewis Speaks to American Chemical Society

DR. HARRY F. LEWIS, dean of the Institute of Paper Chemistry, was one of the speakers in a symposium held September 17 before the American Chemical Society at its 122nd national meeting at Atlantic City, N.J. He spoke on the subject of recruitment of chemists, discussing the problem as it appears to the academic officers of the Institute. The viewpoints of industry, the university, the liberal arts college, and the high school were represented by speakers on the program.

Other members of the Institute staff participating in the meeting were *DR. KYLE WARD, JR.,* and *DR. IRWIN PEARL.*

WILLIAM A. WRIGHT, director of service operations for Kimberly-Clark Corp., has been named administrative vice president of International Cellucotton Products Co., Chicago. He has been with Kimberly-Clark 22 years. He will be succeeded by *H. W. PIERCE,* head of the firm's planning department.

ROY E. TROUTMAN has been named sales manager for white pigments in E. I. du Pont de Nemours & Co.'s Pigments Department. At the same time, three other changes in pigments sales were announced. *DONALD C. BOOTH,* manager of the southwestern sales office at Houston, Texas, was made assistant manager of the southeastern office at Philadelphia. *H. C. BALLARD,* a salesman in the Houston office, succeeds Mr. Booth. *JOHN W. CROFT,* a chemist in sales service at the Newark, N.J., pigments plant, succeeds Mr. Ballard as a salesman in the southwestern area, with headquarters at New Orleans.

FRANK C. WILLIAMS, of Ridgewood, N.J., has been elected vice president of Alford Cartons, Ridgefield Park, N.J. He has been sales maanger of the company since 1949.

F. C. Williams

Blake Honeyman

BLAKE HONEYMAN, vice president of Morden Machines Co., and Mrs. Honeyman left September 25 for a month's business trip to Japan. Mr. Honeyman will inspect recent installations of 26 Morden "Stock-Makers" in

NASH ENGINEERING COMPANY
423 WILSON AVE., SO. NORWALK, CONN

12 Japanese mills and will visit other mills interested in Morden machines.

JOHN C. CLAY, on leave as assistant to the executive vice president of National Starch Products Inc., New York, N.Y., has been appointed director of the Containers and Packaging Division of NPA. During the past 10 years Mr. Clay has specialized in military packaging and all types of industrial packaging problems in the paper, paperboard container, transparent film, can, woodworking, bottling and materials-handling industries.

LESTER J. SMITH, manager of Gould Paper Co. in Lyons Falls, N.Y., since 1946, has resigned his position to be succeeded by *JOHN BRUSH*, former assistant manager. Mr. Brush was associated at one time with Kimberly-Clark Corp. in Wisconsin and New York.

WESLEY H. HOFFMAN has been promoted to general sales manager of Harrington & King Perforating Co., Chicago. He succeeds David K. Colesberry, who resigned from the post recently. Mr. Hoffman was formerly Chicago district sales manager and has been with the firm 20 years.

L. L. G. BENTLEY, of Canadian Forest Products Ltd., has left for Europe to try to improve British Columbia's pulp sales.

WALLACE UNGEMACH, president of Wallace Paper Box Corp., Maspeth, L.I., N.Y., has been elected president of National Paper Box Manufacturers Association. *CLARENCE E. CROSS*, president of Foster & Cross, Inc., Brooklyn, was named vice president.

FRANK J. LOVEGREN has joined the new product development department of P. H. Glatfelter Co., Spring Grove, Pa.

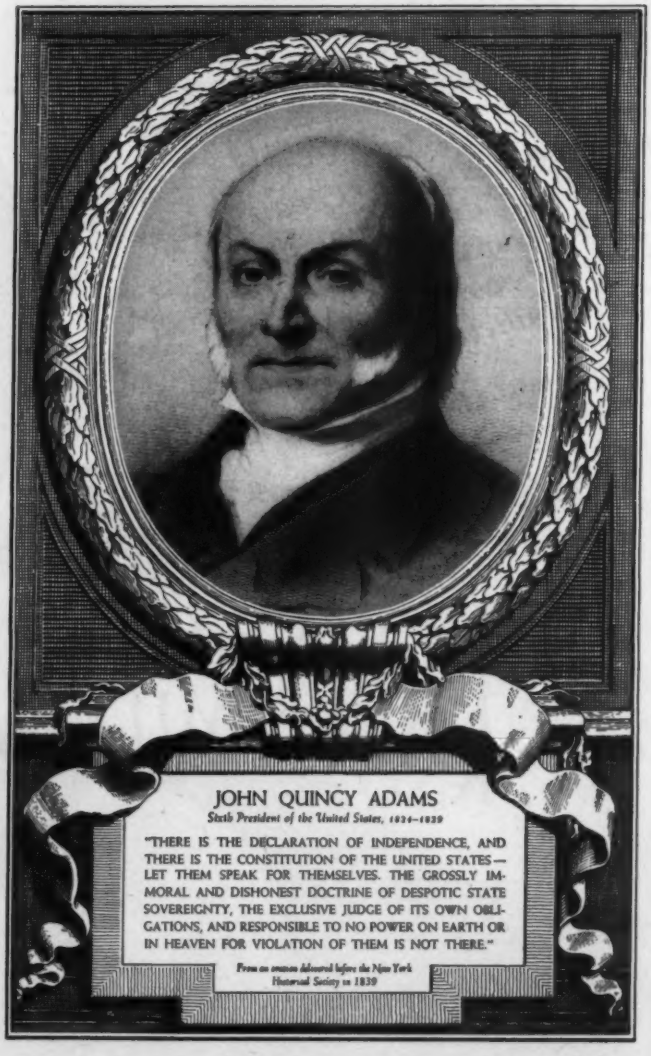
J. C. HITCHMAN, assistant mill superintendent of the Port Arthur division of Provincial Paper Ltd., Toronto, Ont., has been appointed paper mill superintendent.

G. FINDLEY GRIFFITHS has been appointed vice president of sales of Acme Steel Co., Chicago. He joined the company in 1950 and has served as assistant to the executive vice president and assistant to the president in charge of distribution.

DeLaval Steam Turbine Co., Trenton, N.J., has announced the following appointments: *R. G. BAKER* to regional sales representative, and *C. C. BRAY* to manager of the Chicago district office. Mr. Baker will cover the territories of the company's Chicago, Detroit and Minneapolis operations, but will continue to make his headquarters in Chicago. He has been manager of the Chicago district office since 1934. Mr. Bray formerly was manager of the Midwest district office of the company's Standard Product Division.

E. E. REAGLE recently joined the technical staff of the sales department of the Tubular Products Division of Babcock & Wilcox Co., Beaver Falls, Pa. He will make his headquarters at the general sales offices of the division at Beaver Falls.

Wheelco Instruments Division of Barber-Colman Co., Rockford, Ill., has announced the following personnel changes: *RICHARD K. HUNGERFORD*, who was transferred from New York, has been made district manager of the Baltimore office; *GORDON HUBBERT*, formerly in the Chicago office, is now district manager in Detroit; *HOWARD P. BERGER* has been transferred from Baltimore to Cleveland, and *HAROLD F. DAHLKE* has been transferred from Chicago to New York. Dis-


JOHN QUINCY ADAMS
Sixth President of the United States, 1824–1829
"THERE IS THE DECLARATION OF INDEPENDENCE, AND THERE IS THE CONSTITUTION OF THE UNITED STATES—LET THEM SPEAK FOR THEMSELVES. THE GROSSLY IMMORAL AND DISHONEST DOCTRINE OF DESPOTIC STATE SOVEREIGNTY, THE EXCLUSIVE JUDGE OF ITS OWN OBLIGATIONS, AND RESPONSIBLE TO NO POWER ON EARTH OR IN HEAVEN FOR VIOLATION OF THEM IS NOT THERE."
From an oration delivered before the New York Historical Society in 1839

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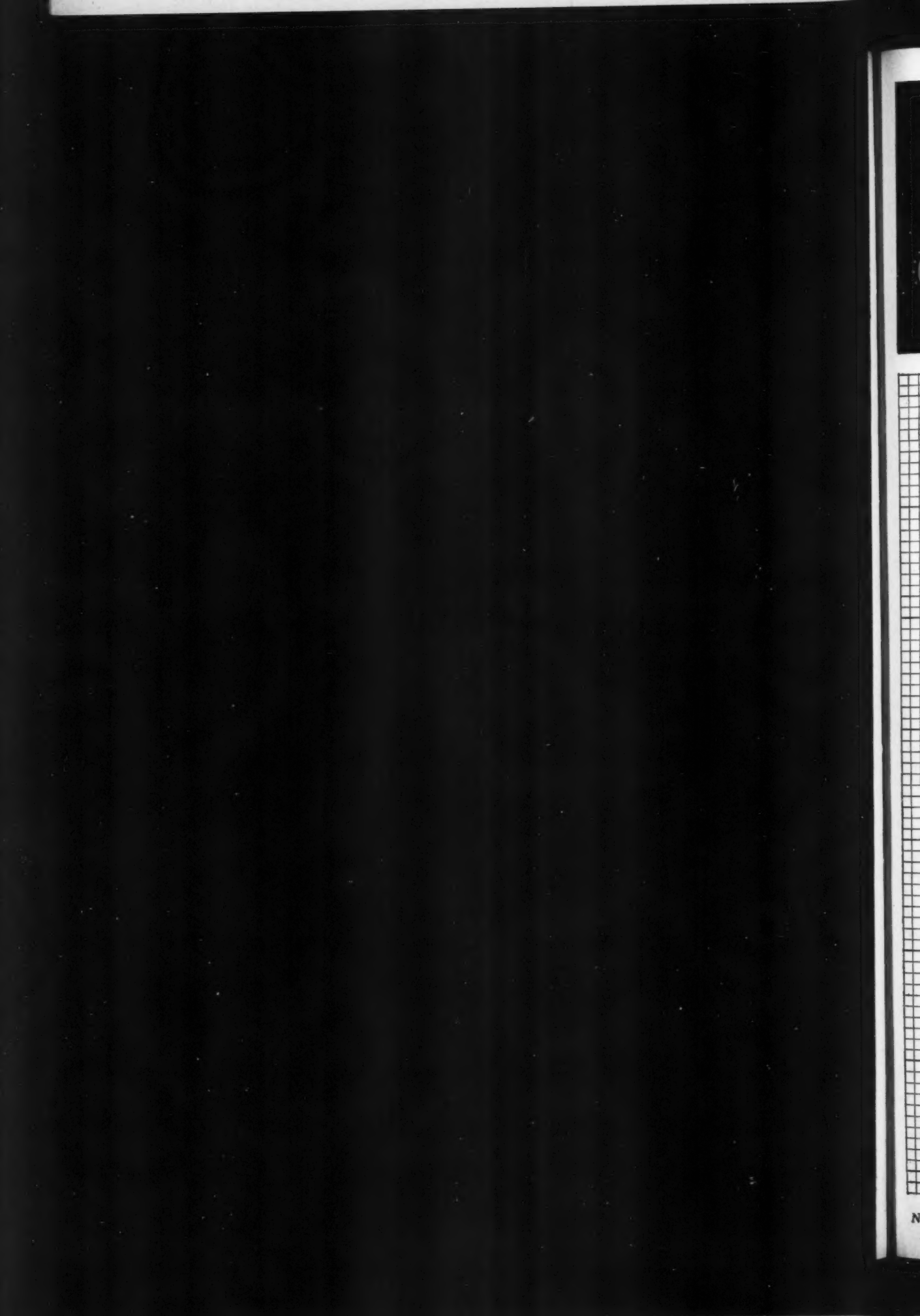
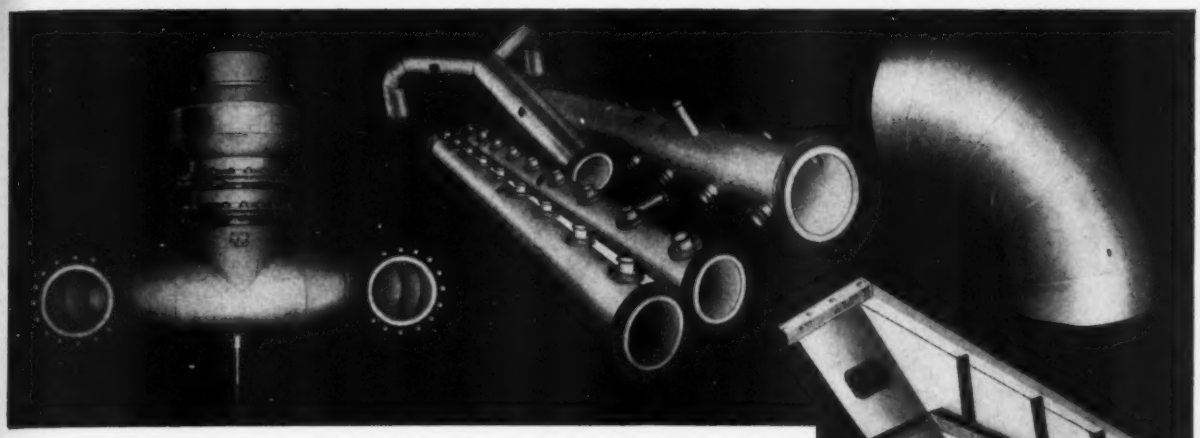
The DRAPER Belt





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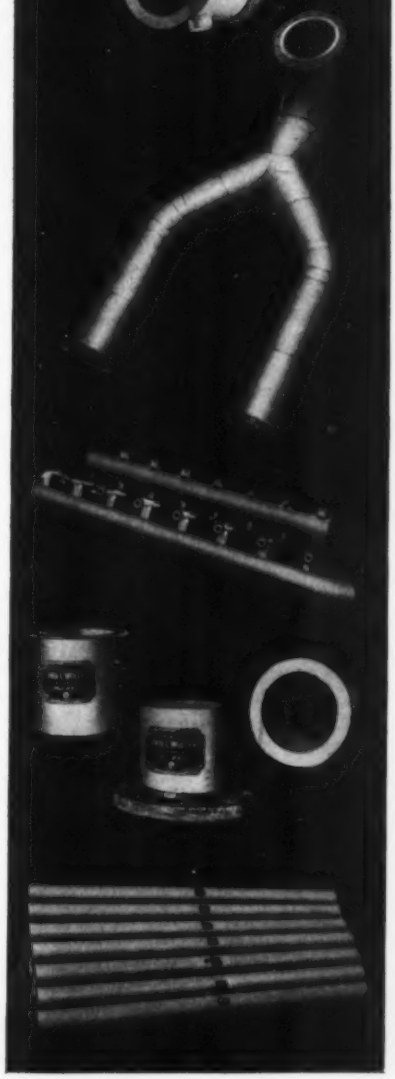


trict managers of three new district offices are: *ROBERT P. CAMPBELL*, Grand Rapids, Mich.; *EDMUND C. McFAUL*, Cincinnati, Ohio; and *EARL J. KELLY*, Clarksburg, W.Va. A suboffice under Clarksburg is located at Charleston, W.Va., with *J. McKEOWN* in charge.

Nekoosa-Edwards Paper Co., Port Edwards, Wis., has named *DONALD LICHTY* assistant controller.

W. E. SOLES has been made general manager of Anglo-Canadian Pulp & Paper Mills Ltd., Quebec.

J. D. McPHERSON has been made sales supervisor of the organic acids and plasticizers departments of American Cyanamid Co.'s Industrial Chemicals Division. He was formerly assistant to the director of purchases.

O. C. HOLLAND has been appointed director of advertising and sales promotion for Interchemical Corp., Printing Ink Div. He succeeds the late George Welp, with whom he served as assistant director for the past five years.

Compressed Gas Association, Inc., has elected *R. WOLCOTT HOOKER* president. Mr. Hooker is vice president in charge of sales for Hooker Electrochemical Co. He was also recently elected president of The Chlorine Institute, Inc., for the fourth consecutive year.

EDWARD C. REID has been elected president of American Writing Paper Co., Holyoke, Mass. He succeeds Thomas A. Blodgett.

WILLIAM S. WOODWARD has been appointed resident manager, and *LOUIS J. WILHORN*, general superintendent of Hennepin Paper Co., Little Falls, Minn.

Hercules Powder Co., Wilmington, Del., has announced new assignments for four cellulose products department-district sales managers. They are as follows: *JAMES R. YEAGER*, manager, lacquer promotion, Wilmington; *PHILIP F. ROBB*, district sales manager, New York City; *HENRY P. GRACE*, district sales manager, Detroit; *HOWARD S. LAWTON*, district sales manager, Cincinnati.

EDWIN H. SCHMITZ, general sales manager, Standard-Knapp division of Emhart Manufacturing Co., Portland, Conn., has been elected president of Packaging Machinery Manufacturers Institute for the coming year.

Z. A. ZASADA, forester in charge of the upper peninsula experimental forest at Marquette, Mich., will take charge of the headwaters forest research center, Grand Rapids, Minn., it was recently announced by the lake states forest experiment station. He will replace *L. P. NEFF* who has transferred to the regional forester staff at Milwaukee, Wis.

CHARLES P. ORCHARD, vice president of Orchard Paper Co., St. Louis, Mo., has been appointed a member of the St. Louis Board of Police Commissioners by Gov. Forrest Smith.

MELVIN NOLAN, superintendent of the coating plant of Newton Falls Paper Mill, Inc., Newton Falls, N.Y., will make a trip to Belgium, where he will assist in the installation of new machinery in a large Brussels area paper mill.

ALFRED E. LAMBERT, JR., has been named New England manager of distribution sales for the Westinghouse Electric Corp., Pittsburgh, Pa. In his new post, Mr. Lambert will be in charge of sales of distribution apparatus to electric utilities and municipalties in New England.

Hooker Electrochemical Co. has announced two personnel changes. *WILLIAM L. GILLESPIE* has been appointed field salesman for Chicago and the Midwest area. He previously had been in the sales department on technical service. *HAROLD WEVER* has been transferred from the development and research department to technical sales service.

A. M. VAN DOUSER, secretary and treasurer of Marathon Corp., Neenah, Wis., has been elected a director of the Wisconsin State Chamber of Commerce, and *WALTER F. ADRIAN*, executive vice president of Badger Paper Mills, Peshtigo, Wis., has been elected a district vice president.

The Paper Industry Necrology

Gurth A. Whipple, 76, professor emeritus of forest extension at the State College of Forestry, Syracuse, N.Y., died in Salamanca, N.Y., September 11. He had been with the State Conservation Commission before joining the college staff.

Paul G. Bauer, 62, an assistant superintendent of Thilmany Pulp & Paper Co., Kaukauna, Wis., died while at work September 19.

Charles F. Mason, 87, who was a steam engineer at Menasha Paper Co. and Menasha Printing & Carton Co., now Marathon Corp., for 47 years, died recently at his home in Neenah, Wis.

William Greeley, vice president of F. C. Huyck & Sons of Kenwood Mills, N.Y., died in Albany September 17. He had been with the firm since 1920, becoming vice president in charge of felt sales in 1950.

James (Ed) Branscomb, a machinist at Oxford-Miami Paper Co., West Carrollton, Ohio, for 20 years, died October 10. He was 45 years old.

Charles J. Kaiser, 50, vice president and general manager of Stevens Paper Co., Windsor, Conn., died October 9 at a Hartford hospital. He had been associated with the company since 1925.

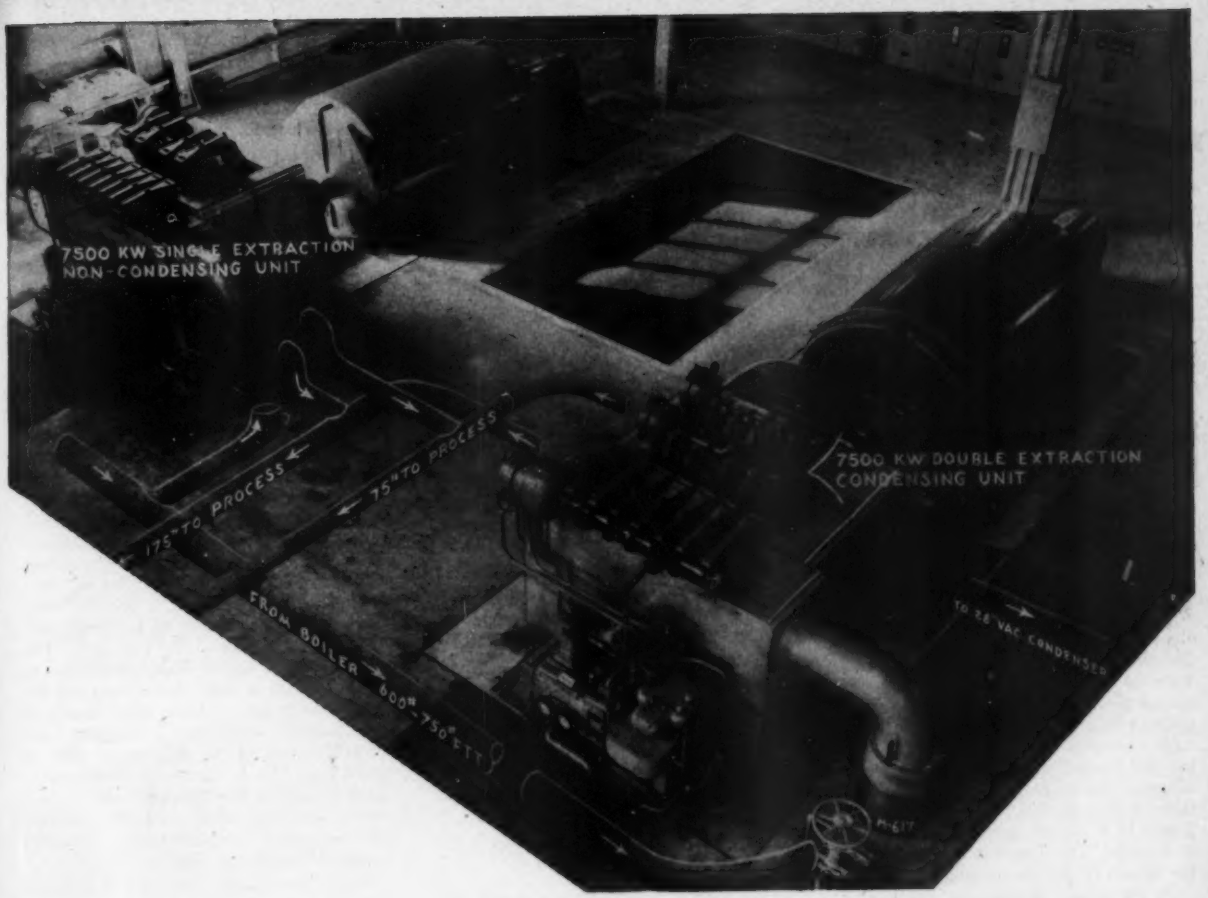
Edwin H. Prattis, managing director of Kilgour Paper Co., Toronto, Ont., died recently at the age of 71. He had been associated with the company since 1899.

Ralph B. Maltby, 75, a director of St. Regis Paper Co. and mayor of Bronxville, N.Y., died at his home October 10.

Raymond Bee, 66, western sales manager of the Southern Kraft Division of International Paper Co., died in Chicago September 1. He had been with the firm since 1931.

Raymond E. Stoltz, of Garden City, L.I., president of National Paper Box Supplies Association and general sales manager of M. D. Knowlton Co., manufacturer of paper box machinery, died August 7 at a Roslyn Park, L.I., hospital at the age of 62.

Charles Feldman, 73, a foreman at Gardner Board & Carton Co., Middletown, Ohio, for 43 years prior to his retirement several years ago, died at his home October 2.



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Foreign Abstracts . . . . . .

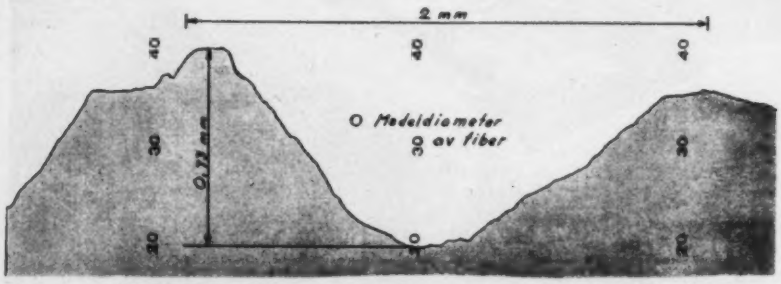

Figure 1

Reproduction of the profile of pulpstone surfaces

Two methods for reproducing the profile of stone surfaces are described. In the first method, impression of the surface is made by pressing a thin aluminum sheet against the stone. This metal impression is surfaced by a specially built piece of equipment termed a "profilograph" which registers the surface profile of the stone on a diagram. The profilograph consists of a pin fastened on a flexible beam (carrying strain gages) by which the movement of the beam is recorded. The diagrams are not detailed (as shown in the highly enlarged Fig. 1).

By the second method, the pin point is placed directly against the pulpstone surface, and the profile is recorded while the stone is slowly revolved. The general shapes of curves by the two methods are similar, but the second method shows minute details not given by the first method.

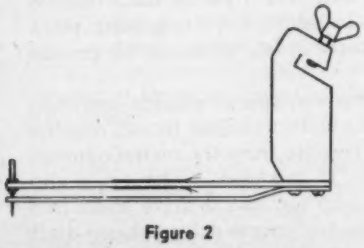

Figure 2

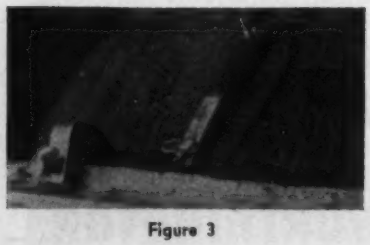

Figure 3

Fig. 2 shows an essential part of the profilograph, and Fig. 3 indicates how this is attached to the pulpstone surface. The curves are evaluated in different ways. Statistical analyses indicated that the length of the curve could be measured with good reproducibility, but other measurements proved doubtful. The relationship between curve length and sharpening depth is discussed.

Experimental grindings (with the simultaneous control of the profile) are reserved for a future publication. 14 references. O. S. Johansson and T. Pettersson. *Svensk Papperstidn.*, **55**, 497-504 (1952). (Original in Swedish, with German and English summaries.)

Soda pulps obtained from flax waste

The authors systematically changed cooking conditions (i.e., temperature, time, and alkali concentrations) in about 40 soda cooks. Thereafter, pulp yields, average degree of polymerization (D.P.), and residual lignin, were determined and microscopic studies were made. The authors conclude that ordinarily the sodium hydroxide concentrations should be kept within 12-18 per cent and that, if commercial pulps with high D.P.'s are required, temperatures of 150 deg., (preferably for 5 hour periods) should not be exceeded. Thus, by heating 5 hours at 150 deg., with 18 per cent sodium hydroxide, a 66 per cent pulp yield (with 4 per cent lignin, and with a D.P. of 1116) was obtained.

Photomicrographs, graphs and extensive tabulations are given for cooks in which sodium hydroxide concentrations of 6, 12, 18 and 24 per cent sodium hydroxide, and temperatures of 140, 150, 160, 170 and 180 deg. were used. Ch. Deissenberg and M. Delaveau. *Bull. assoc. tech. ind. papetiere*, **5**, 467-482 (1951). (In French.)

Pulping sprucewood with alkaline dithionite

With a properly chosen ratio of sodium hydroxide to sodium dithionite ($Na_2S_2O_4$) and suitable cooking conditions, it was possible to pulp sprucewood very satisfactorily. The resulting pulp showed excellent over-all properties. After a series of preliminary experiments, the results of which are given, the authors used a liquor containing 3.48 g. caustic soda and 6.25 g. sodium dithionite per 100 cc., and cooked the wood 8 hours at 180 C. The pulp was obtained in 44.3 per cent yield, retained 2.17 per cent lignin and showed a barytes brightness of 57 per cent.

For comparative purposes, the same wood was also cooked by the soda process (using 3.48 g. caustic soda per 100 cc.) and by the kraft process, using 3.38 g. caustic soda, 1.37 g. sodium sulfide and 0.55 g. sodium carbonate per 100 cc., and digesting 4 hours at 180 deg. The pulp yields by the two common processes were almost identical with those obtained by the NaOH-$Na_2S_2O_4$ digestion, but, in either case, the lignin retention was somewhat higher (5.7 and 3.0 per cent, respectively). The per cent brightness of the soda and kraft pulps, however, were much lower (i.e., 40 and 43.2). Of the three pulps, that obtained by using dithionite was by far the strongest, whereas the soda pulp proved the weakest.

The dithionite pulp consumed the least chemical on bleaching, and the bleached product showed the following properties:—breaking length, 10,580 m.; elongation, 5.58 per cent; burst, 6.4 kg. per sq. cm.; Brecht-Imset tear, 266 cm. g. per cm.; 6036 double folds; brightness, 86 per cent; over-all "quality number," 91 per cent. The pulp showed a degree of polymerization of 905, and gave a paler viscose than did the other two pulps. A three stage bleach of the dithionite pulp gave a brightness approaching that of the kraft pulp after an eight stage bleach (involving, finally, chlorine dioxide). The dithionite which is a strong reducing agent probably prevents the occurrence of unfavorable secondary reactions in alkaline pulping.

In an investigation (recorded in a second paper) the authors cooked sprucewood 24 hours at 170 deg. with 2 per cent caustic soda and 6.25 per cent dithionite. Under these conditions the yield was 46 per cent and the brightness rose to 61.7 per cent. A less satisfactory result was obtained when neutral sodium sulfite was used in place of sodium dithionite; the brightness was lower and the yield (computed on a lignin-free basis) was also lowered. *Mixtures* of dithionite and sulfite led to pulps, the properties of which were intermediate between those obtained when each reagent was used separately. Georg Jayme and Günther Wörner. *Das Papier*, **6**, 80-86; 220-22 (1952). (In German.)

Eucalypt groundwood

Two papers are here abstracted. *Eucalyptus Regnans* woods from 150 to 500 years old (termed mellow wood) and specimens from 12 to 25 years old were converted into strong and weak pulps (respectively). The tensile strength of a series of screen fractions of the two pulps indicated a constant difference in favor of the strong pulp which contained more long fibers. The weaker pulp was rich in fine stuff. The water retention of fractions from the strong pulp was greater than from the weak pulp. Higher water retention was also noted in the case of sawdust from the older mellow wood.

In slow grown wood (about 370 years old) there was a greater proportion of thicker walled fibers, and the average fiber length was greater than in fast grown wood (about 6 years old). Apparently a

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good quality of mechanical pulp from Eucalyps is correlated with long fibers and thick cell walls. 1st paper by J. L. Somerville and J. S. Burkett. *Australian Pulp and Paper Ind. Tech. Assoc. Proc.*, **5**, 146-69 (1951); 2nd paper by H. E. Dadswell, *Ibid* **5**, 170-87 (1951) through *C.A.* 46, 8854-55 (1952).

Alcohol distillation from fermented sulfite spent liquor

The distillation was studied during the evaporation of the waste liquor and formulas were derived which make it possible to calculate the theoretical alcohol recovery. The liquid-vapor equilibrium is discussed and equations for the calculation of the equilibrium at sub-atmospheric pressures are given. Finally the recovery of alcohol in several full scale plant operations is studied. The tabulated results are compared with the values calculated by the authors, and the agreement is surprisingly good. The article contains 6 figures, 2 tables and 12 references. Olof Samuelson, Gunnar Gabrielson and Nils Hartler. *Svensk Papperstidn.* (Kongress nummer), **55**, 613-19 (1952). (Original in Swedish, with English and German summaries.)

Ink transfer to newsprint

This is a contribution from the Graphic Arts Research Laboratory in Sweden. A series of experiments were made under varying conditions in an automatic letterpress printing machine. The ink distribution (y) between the form and newsprint depends upon printing conditions such as the *amount of ink on the form, the printing pressure, the viscosity of the printing ink* and the *speed of printing*. These variables also determine the ink distribution between paper and forms.

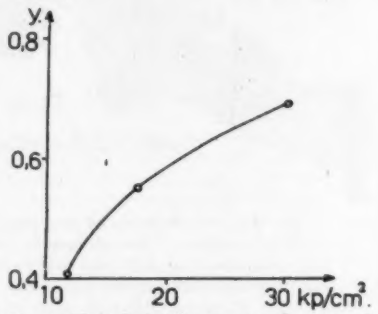

Fig. 1—The ink distribution as a function of the printing pressure

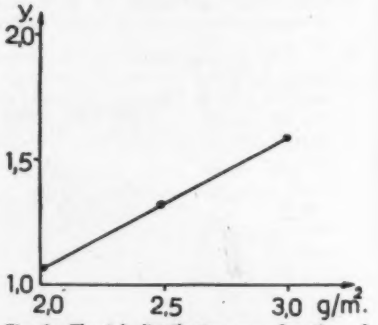

Fig. 2—The ink distribution as a function of the amount of ink on the printing surface

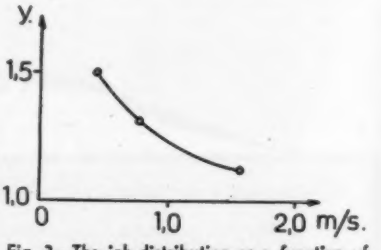

Fig. 3—The ink distribution as a function of the printing speed

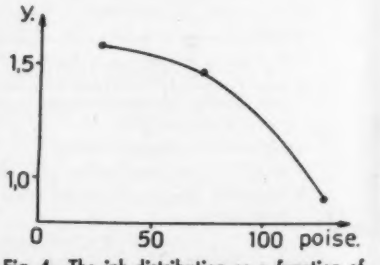

Fig. 4—The ink distribution as a function of the apparent ink viscosity of the ink

The effect of individual variables on ink distribution has been determined and has been represented graphically in Figs. 1, 2, 3, and 4. Conditions under which trial printing of newsprint should be performed are discussed. Ingemar Olsson and Lennard Pihl. *Svensk Papperstidn.*, 55, 421-25 (1952). (In English.)

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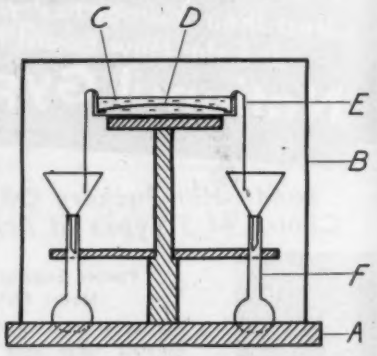
Analysis of pine heartwood components

The authors have devised a method for the quantitative estimation of the pinosylvin phenols (which interfere seriously with sulfite digestion) of pine heartwood. A three gram sample of air dried wood meal was extracted 8 hours with acetone in a Soxhlet apparatus (using a glass, *not* a cellulose thimble). The acetone extract was concentrated to small volume and diluted to 5 ml. A definite amount was chromatographed and the phenols after extraction were determined by ultraviolet absorption. The initial chromatographic chamber was equibrated with solvent vapor and a plain paper strip was run throughout to serve as a blank. The solvent used in developing the chromatogram had the following composition (by volume):—benzene (50), methanol (1), ligroin (50), and water (50). Only the organic phase of this mixture was used, and the chomatogram was run at 20 C.

After about two hours the paper strip was removed and air dried (the operator's hands were not used). The zones PS (pinosylvin) and PSM (monomethyl ether of PS) were localized by means of a quartz lamp and marked. The PSM had generally moved 20-25 cm. from the starting line. The PS zone had moved only 1-2 cm. (with the zone still covering the starting line). The PSM zone was cut out completely, and the lower end of this strip cut to form a point and introduced into the "leaching chamber" shown in the accompanying figure and extracted overnight with 96 per cent ethanol. The extract slowly dripped into a 5 ml. volumetric flask. (The remaining paper strip must give no coloration with bis-diazotized benzidine.) The optical density of the extract (made up to volume) was measured at 305 millimicrons in a Beckman D. U. spectrophotometer and compared with the blank. Using a suitable calibration curve, the PSM percentage in the wood was calculated. The remaining paper (from which the PSM zone was clipped) was then chromatographed, as above, for another 24 hours. Any other components (like pinocembrin and pinobanksin) were washed off, and the PS moved very slowly about 6 cm. from the initial line.

Again the PS was localized by a quartz lamp, the appropriate strip removed, and the PS leached out and determined by a technique similar to that described above. When a phenolic content of one per cent is at hand, a complete analysis can be made with a gram (or less) of wood.



"Leaching chamber" for the extraction of PS and from paper chromatograms showing: (A) wooden support; (B) glass cylinder; (C) glass dish with ethanol; (D) watch glass; (E) paper strip; (F) 5 ml volumetric flask

In a second paper, various pine heartwoods were analyzed by the above procedure. Even when pines were grown under very similar conditions, there were often marked differences in the phenol content. Contrary to previous experience the ratio of PS to PSM was subject to wide fluctuation. The PS is higher in the peripheral (younger) portion of the heartwood, than in the (older) central region, and the *total* amount of phenolic bodies is usually less in the central part of the heartwood. The PSM is less toxic than is PS and condenses less readily with the lignin than does PS. Branches and root heartwood were especially rich in the phenols, the content of which often ranged from 2 to 3 per cent (and at times reached 5 per cent).

Sapwood was shown to contain traces (0.02 per cent) of phenolic bodies. Wood dipped in a 0.01 per cent solution of pinosylvin for ten minutes was uneaten by termites for 1½ years. (First paper) Gösta Lindstedt and Alfons Misiorny, *Svensk Papperstidn.* (Kongress nummer), **55**, 602-604 (1952); (second paper) H. Erdtman and Alfons Misiorny, *Ibid*, 605-608. (Both in English.)

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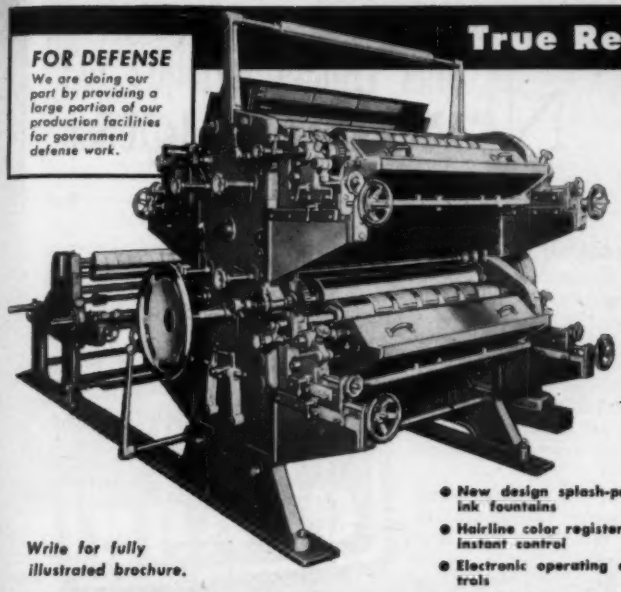

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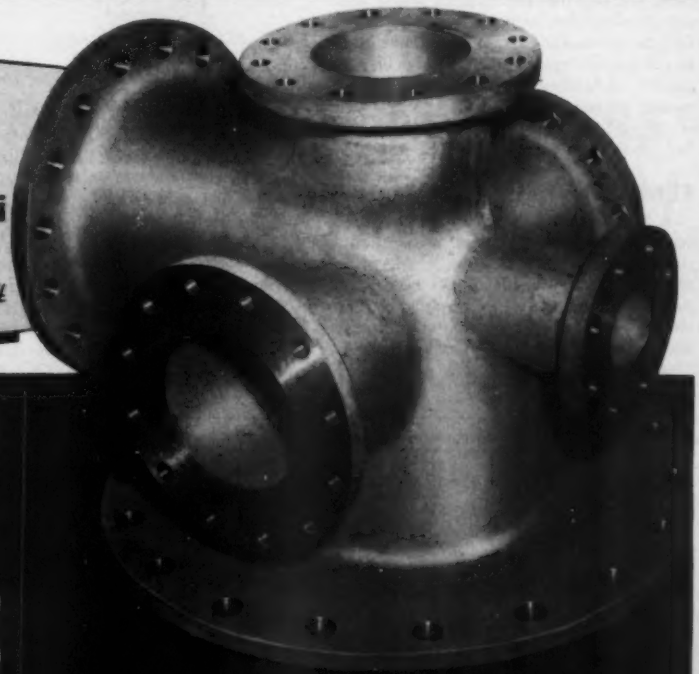

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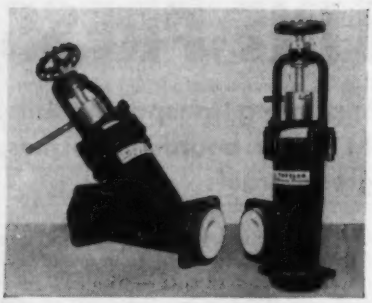


Chemical porcelain

"Tufclad" is the name given to Lapp's new line of chemical porcelain armored with fiberglass-reinforced plastic.

The armor is applied in the form of multiple layers of heavy fiberglass woven cloth, impregnated with a special modified phenolic resin of high adhesive strength for bonding to porcelain and between layers of cloth. Jet black in color, the oven-cured armor shell fully covers porcelain, running end-to-end and under flanges.

Advantages of this armor are said to include the fact that the resilient armor shell acts as a cushion to protect against impact damage in handling or operation and insulates porcelain against thermal shock. It is capable of holding operating line pressures against gross leakage even though porcelain is cracked or broken. *Lapp Insulator Co., Inc., Process Equipment Div., Le Roy N.Y.*

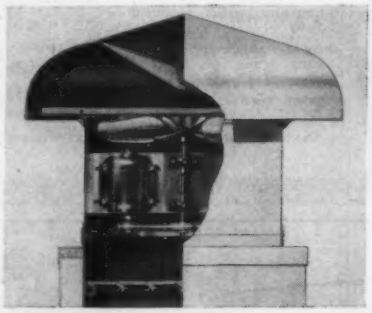
Filter spray jets

A new method now makes the spray jets of self-cleaning filters a part of a removable strainer assembly which is inserted from the outside of the header and passes through it. When a spray becomes clogged it is merely necessary to unscrew the assembly from the outside of the tank, clean the nozzle and replace it. *Hercules Filter Corp., Paterson, N. J.*

Self-forming packing

Self-forming, self-lubricating and leakproof, this steamfitters' special self-forming packing in rope style forms itself into a seal of the exact size and shape of the stuffing box or fitting into which it is placed. It may be used in reciprocating boiler feed pumps, centrifugal oil pumps, valves, etc., against oil, gasoline, most solvents, mild acids and caustics, steam, air, and hot or cold water.

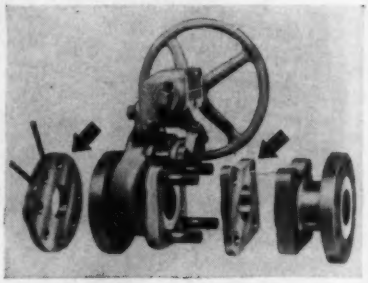
Only one size of this packing, which gives the user a complete packing stock on a single spool, is made or needed. It is available in ½ lb. and 2½ lb. spools. *Flexrock Co., Packing Div., 3652 Filbert St., Philadelphia 4, Pa.*



Ventilator

The new Burt low-type ventilator may be used as an exhaust fan ventilator or as a fresh air supply unit. It is weatherproof, quiet, and simple to install.

This new ventilator can be supplied with either a direct motor-driven fan or with a V-belt and pulley drive. Sizes range from 12-in. to 60-in. fans. Standard construction is prime galvanized steel but other materials, such as aluminum, stainless steel, etc., may be employed for special purpose use. *Burt Manufacturing Co., Dept. PI, Akron 11, Ohio.*



Electrically-heated valves

Designed to keep valve mechanisms clear of frost and ice in liquid carbon dioxide lines at temperatures as low as —110 F., electrically-heated valves are now available. Many other applications are being developed which include both hot, cold and viscous liquid and gas lines, as well as uses where heated valves have heretofore been economically impractical.

Single-disc valves require the heating element at right in the illustration. Double-disc valves can be equipped with both elements illustrated. Heat from the elements is transmitted directly to the valve seats, and, as a result, heat the entire flow opening through the valve, in addition to the operating mechanism.

All heated valve sizes from 2 in. to 6 in. are available, with pneumatic, hydraulic, solenoid or manual control. *Okadee Co., 332 S. Michigan Ave., Chicago 4, Ill.*

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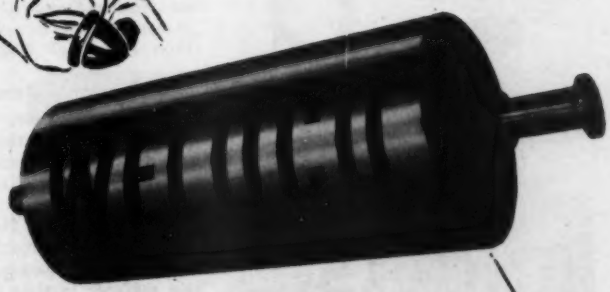

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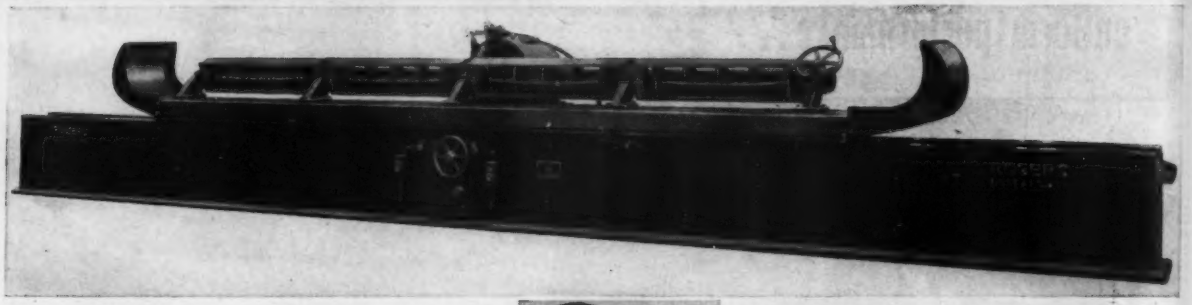

Series 220 . . . is a powerful, new design for high production and fast grinding of all heavy-duty straight knives. Model illustrated above handles knives up to 200" long. Its sturdy cabinet base is 30' long and its entire weight is more than 10 tons.

A unique development allows for grinding 2 up . . . a 90" stroke grinder therefore has the same capacity as 180" stroke machine. Variable, reversing motor drive allows for fast feeds . . . up to 100 fpm. Magnetic chucks are available to further speed grinding cycle.

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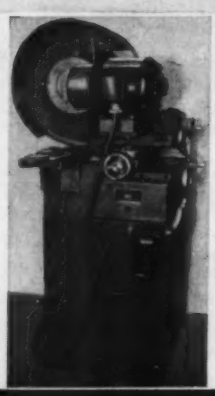

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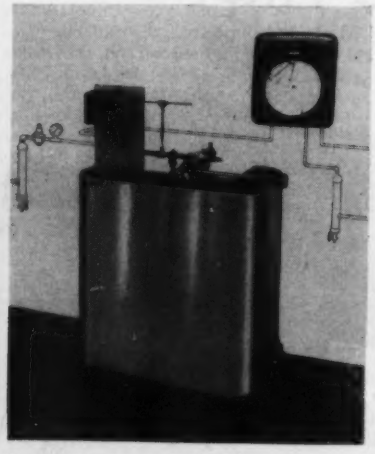
This flow meter can be used for laboratory work, as well as for industrial flow and automatic control applications. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*



Consistency regulator

The Bird consistency regulator is now available with pneumatic control and air operated dilution valve as optional equipment to the mechanical type impulse transferer and regulating device.

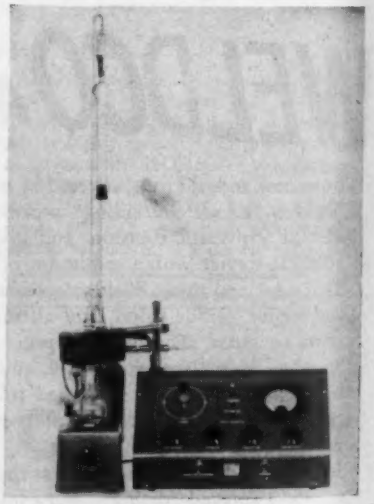
The regulator operates as follows. Stock flows through the stainless steel indicator box, passing into a channel under a balanced copper float. Stock of lower consistency runs faster than stock of higher consistency. The level falls or rises accordingly, and the movement of the float is picked up by a Foxboro position transmitter which transmits it to a Foxboro Stabilog controller. The controller operates the dilution valve.

The recording controller may be located at any point convenient for the operator and does not have to be close to the indicator. A two-pen chart record shows the regulated consistency and the valve opening for the incoming stock. *Bird Machine Co., South Walpole, Mass.*

Diaphragm valves

To meet the processing industry's need for a corrosion resistant valve that makes effective and satisfactory use of the characteristics of Saran, Saunders Patent valves with transfer molded Saran lined bodies are now available. These valves come in sizes from 1 in. through 6 in. with flanged bodies only. Screwed end solid Saran bodies are available in sizes from ½ in. through 2 in. All sizes, screwed or flanged, may be equipped with Saran rubber diaphragms or diaphragms of any of 15 other materials.

Another recent addition to the Hills-McCanna range of body materials and linings is the polyethlene lined body. The lining is suitable for handling all types of inorganic chemicals in aqueous solution and high concentrations of inorganic acids. Polyethlene lined valves may be used at temperatures of 125 F., and pressures to 150 psi. Sizes range from 1 in. through 8 in. The lining is normally applied to cast iron bodies, but may also be applied to stainless steel bodies. *Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill.*



Water content meter

A new instrument which may be used to determine the moisture content of pulp, paperboard, paper, and other materials has recently been introduced.

This instrument, known as the Beckman Aquameter, uses the Karl Fischer technique, thus eliminating errors caused by temperature effects, oxidation and decomposition

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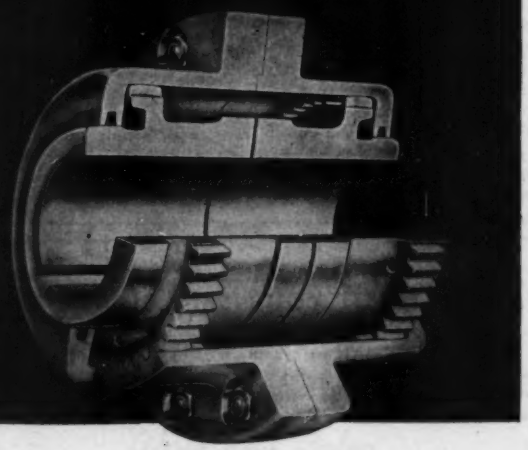


A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

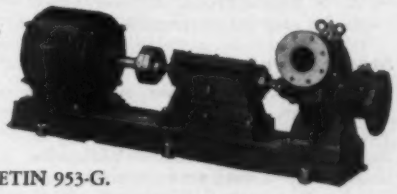
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

"Buffalo" *Tips on Better Pumping*

4 STOCK JOBS AND THE PUMPS TO HANDLE THEM—

1 HIGH CONSISTENCY STOCK WITH LOW SUBMERGENCE

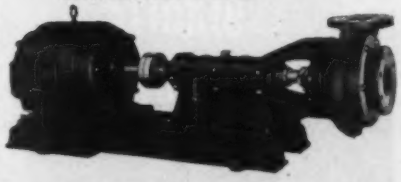
"Buffalo" DIAGONALLY SPLIT-SHELL



—with high-efficiency non-clogging enclosed impeller. Upper half of casing easily removed for impeller inspection or servicing. WRITE FOR BULLETIN 953-G.

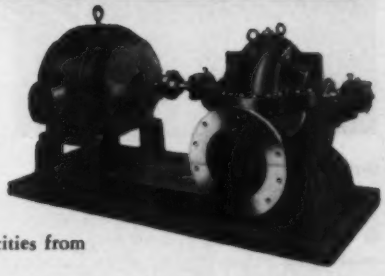
2 SIZE, LIME, CLAY SOLUTION, SILICATE OF SODA, CORROSIVE LIQUIDS

"Buffalo" FULL BALL BEARING CHEMICAL PUMP



—ruggedly built with solid shell and adjustable discharge. Non-clogging, easy to service, high in efficiency.

3 FOR WHITE WATER

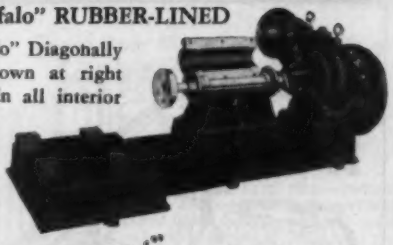


"Buffalo" "SL" Pump

One of our most popular pumps. This sturdy double suction model will provide many years of dependable, economical service. Capacities from 10 to 10,000 g.p.m.

4 CORROSIVE OR ABRASIVE LIQUIDS – CHLORINATED SOLUTION, HYDROCHLORIC ACID

"Buffalo" RUBBER-LINED



—the famous "Buffalo" Diagonally Split-Shell Pump shown at right with rubber lining in all interior parts in contact with liquid. WRITE FOR BULLETIN 935-G for further helpful facts on stock pumping.

"Buffalo"

BUFFALO PUMPS, INC.

213 MORTIMER STREET BUFFALO, N.Y.

Subsidiary of Buffalo Forge Company

Canada Pumps, Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

such as are introduced by oven-drying procedures. However, it eliminates the color-judging factors necessary in conventional Karl Fischer methods.

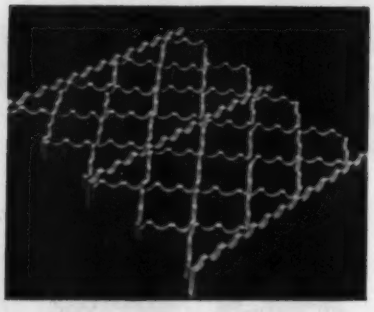
Basically, the instrument consists of an electrically controlled titrating unit into which the sample is introduced. A knob on the control unit is set and the instrument completes the titration automatically. Normally, only one to two minutes are required for a complete determination.

The Aquameter operates on standard 115 volt, 50-60 cycle a.c. circuits and utilizes the "dead stop" technique recommended by the U. S. Pharmacopoeia. *Beckman Instruments, Inc., South Pasadena, Calif.*

Solenoid valves

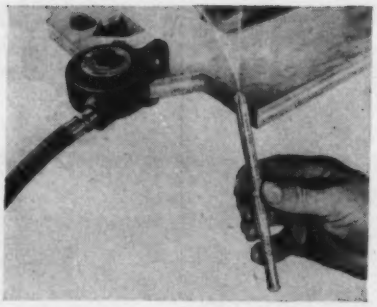
Recent developments have brought new improvements in the Atkomatic line of solenoid valves. Outstanding of all the features of this valve is the adjustable timing on the closing stroke which is available on all valves to a pressure of 300 lb. psi. This feature eliminates shock on supply lines, particularly on hydraulic operations.

These solenoid valves are available for pressures up to 3,000 lb. psi. They are packless, easily maintained, and are designed to handle hydraulic operations, oil, water, steam, air, gases and media not harmful to bronze. *Atkomatic Valve Co., 545 W. Abbott St., Indianapolis, Ind.*



Grating

A new, ⅛ in. stock grating which prevents walking hazards caused by oil, grease, or water has recently been developed. The outstanding feature of the slip-proof grating is that its serrated edges give sure footing but are still comfortable to walk and stand on. *Bustin Firm-Grip Grating Corp., 110 East 130th St., New York 37, N. Y.*



Vibration slide rule

A new pocket-size instrument for accurately measuring the speed and amplitude of vibration on machinery or on bins and hoppers where vibration is produced intentionally to aid materials movement, is now available to the industrial field at the price of a fountain pen.

This new vibration slide rule, known as the Fowler "Vibra-Tak," is only 6¼ in. long. It has a movable tuning slide that indicates on a number scale the speed of vibration. To operate the "Vibra-Tak" you place the bullet nose against the vibrating object and move the tuning slide up and down the scale until the wire reed, which extends out of the nose as the slide is moved, reaches the maximum "throw." Then, you multiply the scale reading by 1,000 to get the vibration in cycles per minute, or shaft speed in rpm. The arc through which the reed "throws" is in direct proportion to amplitude. It has a range of 2,000 to 15,000 cpm. Higher speeds register and can be closely estimated.

The "Vibra-Tak" reveals "dead" spots on equipment where vibration is induced and also aids in the locating of unwanted vibration on other equipment. *Martin Engineering Co., Kewanee, Ill.*

Primer

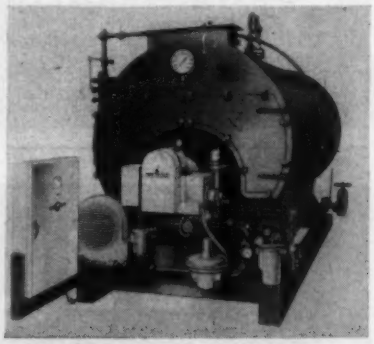
A new heavy-duty primer, known as Prufcoat Primer P-50, makes possible the application of vinyl coatings by a simple "prime and paint" procedure, just like ordinary paints. It is no longer necessary to use special application techniques, just prepare the surface by routine methods such as wire-brushing, apply ready-mixed heavy-duty primer and make vinyl top coat application after only overnight drying.

Some other advantages of this primer are: controls underfilm corrosion, assures positive adhesion, and is suitable for all types of finish materials. *Prufcoat Laboratories, Inc., 50 East 42nd St., New York 17, N.Y.*

Packing gland

A new midget packing gland, designated at Model MPG, is designed as a standard seal for entry of small dial-type thermometers, thermocouple wells, pitot tubes, static pressure probes, round rods or tubes or insulated electric lines into pressure systems of gases, vapors and liquids in closed vessels under positive and negative pressures. As a tube seal the packing gland may be used as a standard male connector for tube ends or as a standard compression fitting.

This midget packing gland is machined entirely from Type 303 stainless steel cold drawn bar stock. The seal is effected by compression of a packing material under a gland follower. This affords straight compression on the packing and avoids rotary slippage during assembly. The threaded connection is a standard ⅛ in. I.P.S. Any packing material may be used with the gland; however, Neoprene is the standard sealant supplied and asbestos graphite is optional for use with sliding or rotating rods and tubes. *Conax Corp., 4515 Main St., Buffalo 21, N.Y.*



Boiler-burner units

A complete new line of boiler-burner units is now available. Each unit consists of an Iron Fireman packaged burner complete with all controls and a Kewanee Scotch boiler, completely assembled with its accessory equipment for oil, or oil and gas, or gas firing.

These completely integrated, compact

WE FABRICATE TO YOUR SPECIFICATIONS

A.S.M.E. Pressure Vessels
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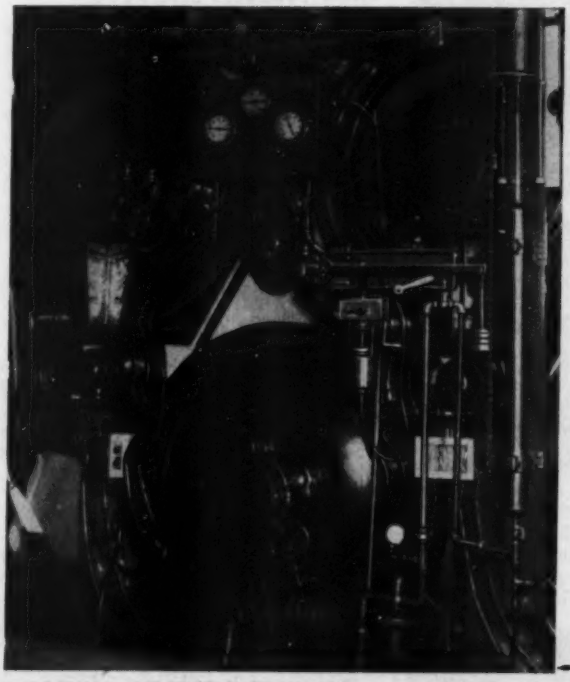
Fitchburg uses Stickle Equipment for Accurate, Economical Control



Virtually every machine in the Fitchburg Paper Company plant is equipped with the Stickle Automatic Tension and Thermal Control.

This Fitchburg, Mass., manufacturer knows that Stickle controls contribute to a better paper . . . at a better price in these three, key ways:

1) Closest possible sheet moisture control;
2) Virtual elimination of manual control;
3) Important steam savings by checking dryer overheating.

For greater steam savings and smoother, more economical operation of *your* paper machines, investigate Stickle controls. Write today for Bulletin No. 160.

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Photoelectric REFLECTION METER

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of pulp and paper in terms of TAPPI specifications. Also for

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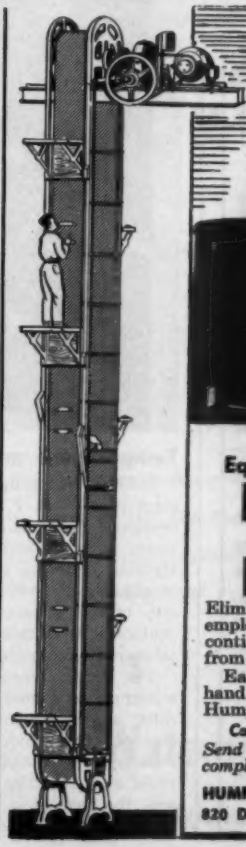

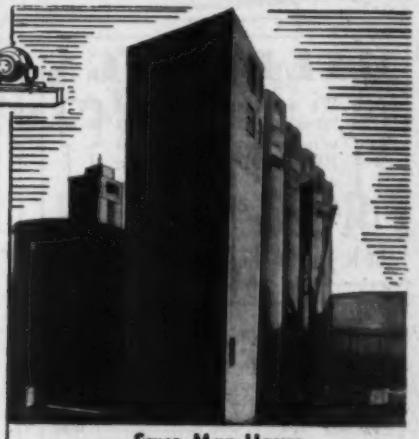

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Employees' Manlift
ELEVATOR

Eliminate stair climbing—save time—reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors.

Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.

Can be installed in any Multiple Floor Building
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820 Division Street • Faribault, Minnesota

units are available for high pressure steam and water in sizes ranging from 52 to 304 H.P., 125 and 150 lb. working pressure; also, for low pressure 15 lb. steam or 30 lb. water, in sizes from 1,808,000 Btu to 8,400,000 Btu. The units are designed for forced draft operation, eliminating the necessity of a high stack. Provision need only be made for a small vent extending above the roof. *Iron Fireman Mfg. Co., Cleveland* 11, *Ohio and Kewanee-Ross Corp., Kewanee, Ill.*

Plastic flooring compound

A new quick-drying plastic flooring compound for use in repairing and resurfacing wooden floors contains special cohesive resins which bind it firmly to wooden floor surfaces without the use of metal binders. Called Rezilo because of its resiliency, this compound is well-suited for aisles and work areas where personnel walk and stand, as well as for areas subjected to heavy trucking. It has a smooth, hard surface, is easily applied, and can be used immediately after application. *Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.*

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Machinery for Ground Wood and Chemical Pulp Mills

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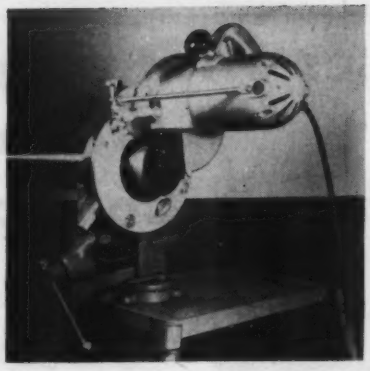
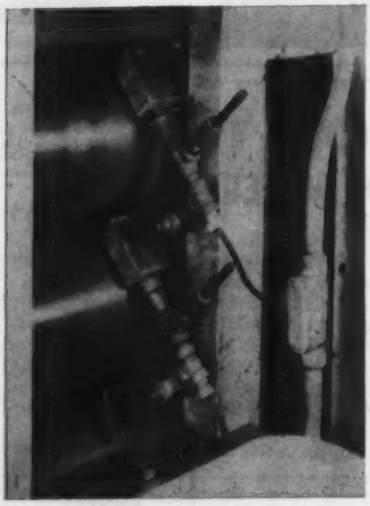


Power cut-off saw

The new, "Super Speed" power cut-off saw is designed for quick, accurate cutting of pipe and tubing of aluminum, copper, stainless steel, etc., in varying wall thicknesses.

The saw uses standard 110-volt alternating current and requires no extra skill or experience. A special, heavy-duty abrasive disk does the cutting. Designed with a free-moving, rotating frame which encompasses the piece to be cut, the cut-off saw is attached to the frame so that both the frame and saw rotate together.

Easily secured to any bench or bench vise, the saw is quickly adjusted to any size tube or pipe. *Tri-Clover Machine Co., Kenosha, Wis.*



Temperature measuring head

Used in measuring roll surface temperatures from —40 F. to 450 F., a newly-developed temperature measuring head operates in conjunction with a high-speed Dynalog recording controller. This system furnishes mills with continuous chart records of roll surface temperatures on such equipment as calenders, slashers, dryers and other roll-type machines.

The temperature-sensitive element is a miniature resistance bulb which lightly rides on the surface of the roll. It is mounted on a block of Marinite which isolates it from ambient temperatures. To avoid any scratching of the surface of the roll, the element is carried by an Eel-slip faceplate, which also wipes the film of air from the roll as further protection against errors from ambient temperatures. The entire unit, with its cast aluminum housing, weighs less than one pound and is approximately the size of a wall switch box. *Foxboro Co., Foxboro, Mass.*

New Products Briefs . . .

AIR-ATOMIZING BURNER — Known as the Voriflow burner, this air-atomizing burner has been refined to simple yet rugged components for firing the Powermaster package unit boilers. Drooling and carbonizing and resultant cleaning and maintenance costs are eliminated. This burner is said to hold full efficiency from the 30 per cent lower limit up to full 100 per cent load. *Orr & Sembower, Inc., Morgantown Rd., Reading, Pa.*

WATERPROOF SWITCH—A new type of sine curve waterproof switch is now available for general use. The basic mechanism that operates this switch is a new type of over-center snap-action motion formed by means of a flat strip of berrylium copper punched out into the shape of a sine curve. An outstanding characteristic of this switch is its ability to resist shocks due to its different configuration. *Control Products Inc., Harrison, N.J.*

SYNTHETIC COATING—A new corrosion-resistant synthetic coating for wood, masonry and metal surfaces, known as Pozcote, contains inert synthetic resins and is impervious to water, acids, alkalis, alcohol, syrups, oils and grease. It is tough and long-wearing and will not crack or peel from temperature changes. It can be used indoors or out. *Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.*

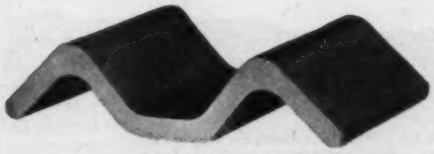
CUT-OFF RELAY—A cut-off relay for providing end-point temperature control for processes requiring automatic shutdowns and manual resetting has recently been developed. The relay operates with an electric temperature or pressure controller and a solenoid or motor-operated valve. It has a capacity of 13 amps. at 115 v, and 6.5 amps. at 230 v, and measures 5¼x4-3/16x2⅜ in. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Aves., Philadelphia 44, Pa.*

PROCESSING PLANT—A range of "package plants" for direct extraction of oil from cottonseed and other seeds of high oil content by the filtration-extraction process is being made available to mills of 75 tons and up. *Lukens Steel Co., Lukenweld Div., Coatesville, Pa.*

THERMOCOUPLE ASSEMBLY — A thermocouple assembly has been designed to precisely detect temperatures in masses as small as plastic molds of 2 oz. The unit can be used for measuring bearing temperatures and for many other processes. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne and Windrim Aves., Philadelphia 44, Pa.*

ENAMEL—Known as Totrust Enamel Instant Dry, this new enamel which incorporates Ruvial, is free-flowing, tough, highly resistant to chemical fumes, has very high gloss, and dries in a matter of minutes. *Wilbur & Williams Co., Boston 35, Mass.*

Bark Hard or Soft Woods up to 8′ in Length Wet . . . Dry . . . or Combined Dry and Wet With F.M.P. Welded M-Bar Barking Drums



M-Bar—Hot Rolled

Exclusively used in F.M.P. drums. Welded and riveted to heavy ship channels.

119—barking drum sales since 1947—(99—12′ D. x 45′ L.; 11-12′ D. x 67½′ L.; 9 misc.)

Barking drums can be furnished with long or short column steel frames to fit customer's requirements. Drumshells shipped completely shop-assembled.

Built-up drumshells and steel frames fabricated at Birmingham, Chicago, and Greenville, Pa.

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As paper-making specifications become more rigid, and as the demands for uninterrupted production become more insistent, you can depend on Oriskany Waterbury Felts to meet your precise requirements.

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The Paper Industry New Literature

Books

LOCKWOOD'S DIRECTORY OF THE PAPER AND ALLIED TRADES. 1952 Edition. Published by Lockwood Trade Journal Co., Inc., 15 West 47th St., New York 36, N. Y. Regular Edition 1503 pages. Traveler's Edition, 5 x 8, 340 pages. $10.00.

Included in this extensive directory are comprehensive reports of the paper and pulp mills in the United States and Canada; an alphabetical list of the names of officers and operating executives of the mills, including their connections; reports of the paper and pulp mills in Latin America and Philippine Islands; a list of idle mills and new mills in the United States and Canada; a classified section showing in alphabetical order the products made by all of the paper and pulp mills in the United States and Canada, and a section showing the names and street addresses of pulp and paper mills and mill agents maintaining offices in the principal cities of the United States and Canada.

A classified section of paper, pulp mill and converters equipment and supplies; reports of converters; converter's products; general paper merchants; paper exporters and importers in New York City; rags and paper stock dealers; pulp testers; trade associations; wood pulp agents; a statistical table showing the number of concerns owning mills, together with the number of paper and pulp mills in the United States and Canada; and an alphabetical list of watermarks and brands used in the American paper trade, with names and addresses of owners, are also found in this volume.

PAPERMAKING IN PIONEER AMERICA. By Dard Hunter. Published by University of Pennsylvania Press. 3436 Walnut St., Philadelphia 4, Pa. 194 pages. 6¼ x 9½. $6.50.

This book, covering the history of papermaking by hand in America for the period 1690-1811, just prior to the introduction of the first paper machine in this country in 1817, commences with a chapter on the beginning of papermaking. It describes the invention of paper by Ts'ai Lun in China in the second century A.D., and traces briefly the history of papermaking in other Asiatic and European countries.

Mr. Hunter goes on to describe the equipment and operation of the early American paper mills, presenting a condensed outline of the actual methods used by the pioneer American papermakers and a brief account of the manner in which the watermarks were formed in the sheets of paper. The next 18 chapters deal with the establishment of the first paper mills in each of the various states, beginning with the first American paper mill set up in Pennsylvania by the German-born Rittenhouse family in 1690 and concluding with the establishment of the first paper mill in Tennessee in 1817 by Colonel William Moore.

Nathan Sellers, a pioneer paper-mould maker and his contribution to papermaking is discussed in one chapter. The final chapter about American papermakers during the period 1690-1817 contains a check list of the pioneer workers who made paper in individual hand moulds, giving their names, localities in which they carried on their trade, date of operation of their mill, and, also, a description of their individual watermarks when the origin has been established without question. At the end of the volume is a section of illustrations, the majority of which are photographs of early watermarks.

FOREST PRODUCTS RESEARCH GUIDE, fifth edition. Published by National Lumber Manufacturers Association, 1319—18th St., N.W., Washington 6, D.C. About 400 pages. $10.00.

More than 17,000 research projects on wood and other forest products, conducted by nearly 3,000 domestic and foreign organizations, firms and agencies, are catalogued in this new edition. The book is a comprehensive directory of specific projects and the firms or organizations conducting them in all the extensive fields of wood research throughout the world. The material was compiled by the NLMA staff in cooperation with that of Timber Engineering Co.'s research laboratory.

Booklets and Pamphlets

CORN IN INDUSTRY. Published by Corn Industries Research Foundation, 3 East 45th St., New York 17, N. Y. 64 pages. 8½ x 11. Besides describing the many and varied uses of products from corn in the food and industrial fields, including the paper industry, this booklet explains in non-technical language the processes by which corn starch, syrup and sugar, and such by-products as corn oil and various feedstuffs are made. Also included are chapters on the historic background of corn, uses of corn products in defense, the contribution of corn refining to agriculture and commerce, and the future potentials of the grain.

NIP HAZARDS ON PAPER MAKING MACHINES (Technical Guide for Accident Prevention No. 4). Published by National Association of Mutual Casualty Companies, 919 N. Michigan Ave., Chicago 11, Ill. 34 pages. 8½ x 11. This report consists mainly of illustrations and explanations of devices known to be practical since they are used in various paper mills for protection against the hazards of inrunning nips. General precautions, wire screen, first and second press, reverse press, smoothing press, dryer section, calenders, winding reels, rewinders and slitters are covered in this booklet.

SHORTCUTS FOR CRUISERS AND SCALERS. By. L. R. Grosenbaugh. Published by Southern Forest Experiment Station, U. S. Department of Agriculture, Forest Service, 704 Lowich Bldg., New Orleans 13, La. A revolutionary method of cruising timber without measuring or estimating tree diameters or plot radius is explained in this paper. Also described are techniques for simplifying mental or machine calculation of log and tree volumes and cull per cent, and for devising sampling plans for cruising or scaling.

HOW YOU CAN AVOID BOILER TUBE CORROSION (article reprint). (Bulletin TR-514). By H. F. Hinst. Published by Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa. 8¼ x 11¼. 8 pages. Corrosion as a major factor in shortening the life of boiler tubes is thoroughly discussed in this illustrated article reprint. It points out the various types and causes of corrosion and offers a number of general rules to follow to get maximum service life for boiler tubing.

INDUSTRIAL WATER ANALYSIS. Published by E. F. Drew & Co., Inc., 15 East 26th St., Palmo, N.Y. 57 pages. $1.00. This booklet covers in detail boiler water sampling, expressions of results, test equipment and general water analysis. It also outlines special tests for versenate hardness, dissolved oxygen, total solids, steam purity by conductance, corrosion tests by N.D.H.A. methods, etc.

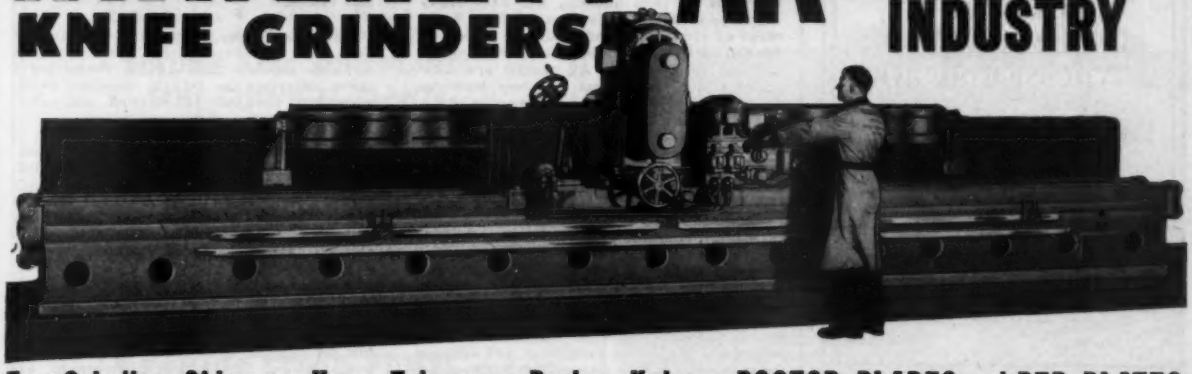
HOW TO START AN ASSOCIATION SAFETY PROGRAM (article reprint). By A. E. Murphy, Executive Director, Folding Paper Box Association of America. Published by American Trade Association Executives, 820 Dupont Circle Bldg., Washington 6, D.C. This article traces steps that trade associations may take in fighting accidents.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.

Industrial Change Rooms. Moore Co., 1036 Quarrier St., Charleston, W. Va.—"The Design and Layout of Industrial Change Rooms" is a 16-page illustrated booklet written for the design engineer, safety engineer, and consultant in change room problems. Architectural standards, dimensioning, equipment and safety are emphasized. The first section contains change room standards, and the second section pertains

HANCHETT AK KNIFE GRINDERS FOR THE PULP & PAPER INDUSTRY



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SPEEDS: 10' to 100'—30' to 150' and Faster
MOTORS: 7½ H.P. to 40 H.P.
WEIGHTS: 10 Tons up to 40 Tons
CAPACITY: 84" to 360" and longer

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GK 32" to 184" Knife Capacity

Tell us your knife problems. Our engineers may have a money-saving solution for you. Write Dept. PI-112.

HANCHETT MANUFACTURING COMPANY
World's Largest Manufacturer of Saw Sharpening and Knife Grinding Machinery
Main Office: Big Rapids, Mich. — West Coast: Portland 4, Ore.

WHEN YOU

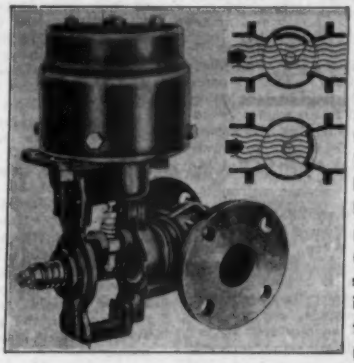
PAINT WITH RUBBER!

You put a tough "rubber coat" on walls, floors, machinery, with Tropical's new rubber-base industrial paints. They defy moisture, chemicals, detergents, scrubbing! Prime and finish-paint fresh plaster the same day. Stop mold or mildew damage on inside walls. Uncured concrete, cement or cinder block or concrete laid directly on cinder fill is painted overnight for use next day. Paint a vapor barrier on inside walls to stop moisture travel to outside. Paint a tight, moisture- and chemical-resistant rubber shield on mechanical equipment!

FREE! Your letterhead request brings complete information on these new Tropical industrial rubber-base paints that out-perform ordinary paints every way—write today!

THE TROPICAL PAINT & OIL CO. SINCE 1883
1116-1264 W. 70th Street • Cleveland 2, Ohio

Pneumatic Operator For DeZurik Plug Valves



Three types of air operation are now available for DeZurik's eccentric-type plug valves in sizes from ½ to 3 inches. Each employs the Bendix-Westinghouse long-stroke diaphragm-type pneumatic operator. Assembly arrangement, interchangeable in the field, is for power to close. Required air pressure is dependent on line pressure through the valve but 50 lb. minimum is sufficient for maximum valve pressure which is nominal at 125 pounds. *MANUAL CONTROL* for on-off action employs an air switch. Manual control with throttling action includes a dial indicator that permits setting the valve in throttling position from a remote location. Automatic control applies a positioner that can be actuated by standard pneumatic indicating-and-control equipment governing a pilot valve.

WRITE for special Air Operator Bulletin to

DeZURIK SHOWER COMPANY
Sartell, Minnesota

The Paper Industry
Professional and Business Services

CHICAGO TESTING LAB.
SPECIALTIES DIVISION
536 Lake Shore Drive, Chicago, Ill.
Complete Paper Testing Facilities
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Engineers
Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys
J. E. SIRRINE COMPANY
GREENVILLE SOUTH CAROLINA

to designing dimensions and selected details. Several photographs of change rooms and sketches to indicate many of the details in laying out the entire room are included.

Scanning System. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Station 40, Wayne & Windrim Aves., Philadelphia 44, Pa.—Instrumentation Data Sheet 10.0-9 describes the applications, operation and pertinent details of the new Brown ElectroniK scanning system. A full description of the unit, plus illustrations of the recorder, control and rectifier units are included. Duplicate chart records showing appearance of various points exceeding the set point are also illustrated.

Turbine Vane Pumps. Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Ave. 26, Los Angeles 31, Calif.—This 12-page bulletin, No. B-2205, describes turbine vane pumps, Types TVE and TVB, for pumping hot and cold, clear and vaporous liquids. Numerous charts and diagrams are included. This bulletin is so constructed that supplemental information may be added later.

Instrumentation. Minneapolis - Honeywell Regulator Co., Station 40, Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—"Fundamentals of Instrumentation for the Industries" is the title of booklet 80-2, which consists of 126 pages. It covers the fundamentals of measurement, control and transmission of variables encountered in industry. Typical applications are also discussed.

Circuit Breakers. Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.—A complete study of Type AB circuit breakers is given in a new 35-page booklet, B-5407. For the first time, photographs show the actual De-ion are quenching action of all AB breakers: confine the arc, divide it, extinguish it.

Packaging Machine. Lynch Corp., Packaging Machine Div., Toledo, Ohio—A new 4-page bulletin describes the Morpac Series "E" paper packaging machine, listing 19 improvements in this machine, in addition to specifications.

Scales. Howe Scale Co., Rutland, Vt.—A compact edition of Howe's complete catalogue of 200 pages, the new 28-page condensed scale catalogue No. 11 is a handy reference, featuring a complete line of modern scales for every industrial need. Complete specifications, spot illustrations, and essential information are included. The catalogue is arranged by types of weight indication.

Spray Nozzles. Binks Mfg. Co., Industrial Nozzle Div., 3114-40 Carroll Ave., Chicago 12, Ill.—This 40-page bulletin, No. 5200, fully describes industrial spray nozzles for a broad range of commercial and industrial processes. Data given include nozzles dimensions, capacities and spray angles. All nozzles are illustrated and in many cases cut-away drawings showing the construction and operation of the nozzle are included. "Blue print" drawings show proper installation details where this information is required. The index lists 29 different applications for industrial spray nozzles with page references for each.

Pressure-Sensitive Tapes. Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.—Two dozen "Scotch" brand pressure-sensitive tapes that meet various government specifications are described in a new 16-page manual containing 42 photographs and illustrations and complete data on tapes for packaging, holding, mending, masking, sealing, mounting, protecting, insulating, and splicing jobs. In addition, the manual lists 11 tapes for the construction and maintenance of electrical and electronic equipment, plus two magnetic recording tapes for such jobs as telemeters, computing and industrial training programs.

Nitrocellulose. Hercules Powder Co., Wilmington, Del.—A 12-page revised edition of the technical booklet about SS Nitrocellulose, a specialty nitrocellulose, includes 20 charts which illustrate studies in solubility of SS Nitrocellulose. The charts are divided into four groups, by the use of color, to show the effect of viscosity of the material; the effect effect of type of alcohol used. Also included of ethanol; the effect of diluent; and the is new information about the use of SS Nitrocellulose in heat-seal lacquers, aniline inks and as a shellac modifier.

Casters and Trucks. Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.—A newly revised 36-page Rapistan caster and truck catalogue, CT-52, contains photos and complete specifications on casters and wheels designed to handle light, medium, or heavy loads on all types of floor surfaces.

Materials Handling Equipment. Mercury Mfg. Co., Dept. 141, 4044 S. Halsted St., Chicago 9, Ill.—A new 44-page product catalogue, Bulletin 300, features Mercury's entire line of current model tractors, trailers, fork lift trucks, platform lift trucks, and load carrying trucks. The three major categories of this catalogue are: the Trackless-Train System, Fork-Truck-Pallet System and the Lift Truck-Skid System. Each of these categories is preceded by an analysis of the applications and merits of each handling system.

Unit Steam Generator. Preferred Utilities Mfg. Corp., 1860 Broadway, New York 23, N. Y.—This 28-page bulletin, No. 2000, describes the engineering differences of component features of the self-contained unit steam generator. Numerous illustrations of the components and the unit, including cut-away views, supplement the descriptions. One section contains comprehensive data and dimensions of the generator and a fully described list of standard and accessory equipment.

Wires and Cables. United States Rubber Co., Rockefeller Center, New York 20, N.Y. —This 186-page general catalogue contains comprehensive data on construction and operating characteristics for U.S. Rubber's line of more than 500 different types of wires and cables.

Vibration Meter. Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 8, Calif.—Bulletin CEC-1505B, containing 4 pages, describes the 1-110B vibration meter, presenting complete information and specifications.

Compressors. Pennsylvania Pump & Compressor Co., Easton, Pa.—Oilfreair and Oilfregas compressors are described in 4-page Bulletin No. 600. A large sectional drawing of the 9-in. stroke Oilfreair compressor carbon cylinder-liner construction is included.

Axle Load Scales. Howe Scale Co., Rutland, Vt.—This 8-page folder (Form 682) illustrates and describes the complete line of heavy-duty Howe axle load scales for checking weights on each axle of motor trucks and trailers. Installation photographs are shown, and construction details are illustrated and described. A complete selection of weight indication is presented. Complete specifications and pit dimensions are listed for nine standard Howe axle low scales with a capacity range of 15, 20 and 30 tons.

Soot Blowers. Copes-Vulcan Div., Continental Foundry & Machine Co., Erie 4, Pa.—Bulletin 1002, consisting of 8 pages, illustrates and describes Vulcan long retractable soot blowers, with air and electric drives, and includes a list of representative users.

Locknuts. Locknut Section, Industrial Fasteners Institute, 3648 Euclid Ave., Cleveland 15, Ohio—A description, principle of operation, and manufacturer of representative types of locknuts are presented in this 24-page brochure. Illustrations of each type of locknut are included.

Cooling Towers. Foster Wheeler Corp., 165 Broadway, New York 6, N.Y.—This 36-page catalogue on cooling towers designated as Bulletin CT-52-4, contains details of construction, charts, suggestions on recirculation, and surroundings. It also includes "Inquiry Data Sheet" for planning your requirements. Many photographs are shown.

Remote Control Positioner. Farris Hydrotorque Corp., 522 Commercial Ave., Palisades Park, N.J.—This 12-page bulletin (No. 157) is a general descriptive folder on the Farris Hydrotorque, a remote control hydraulic positioning system. Many diagrams, tables, graphs and photographs are included.

Radial Air Compressors. Worthington Corp., Harrison, N.J.—Two-stage, air-cooled radial air compressors capable of producing 80 to 125 lb. pressure are described in 12-page Bulletin H-630-B1. Dimensions and weights of the various compressors are given. Capacities, sizes, general specifications and cross section photographs are included. Pictured and explained are Worthington's articulated connecting rod, fan-cooling of isolated cylinders, forced-feed lubrication and Feather-valve. Accessories are also pictured and explained.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946
(Title 39, United States Code, Section 233)

Of THE PAPER INDUSTRY published monthly at Mount Morris, Illinois for October 1, 1952.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Fritz Publications, Inc., 431 S. Dearborn St., Chicago, Ill.; Editorial Director, A. W. J. Dyck, 431 S. Dearborn St., Chicago, Ill.; Business manager, A. Scott Dowd, 431 S. Dearborn St., Chicago, Ill.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

A. SCOTT DOWD, Business Manager.

Sworn to and subscribed before me this 1st day of October, 1952.
[SEAL] EDLA DURBON, Notary Public.
(My commission expires December 26, 1952.)

SULPHITE MILL ACID PLANTS

Sulphur Burning Plants • Jenssen Two Tower Acid Systems • Gas Coolers—Surface and Spray Type • Jenssen Pressure Acid Systems • Jenssen Auxiliary Process Towers • Recovery Plants—Cooking Acid

SOLUBLE BASE ACID PLANTS
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JENSSEN SO_2 ABSORPTION SYSTEMS

FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

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JAMES BRINKLEY COMPANY, Seattle, Washington
FOUNDED 1915

Goulds STOCK PUMPS reduce stock handling headaches

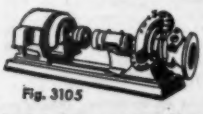
Fig. 3105

Positive even flow. No jamming. Easy to inspect. Easy to adjust for wear. Designed for handling paper stock of all kinds and consistencies. Write for descriptive Bulletin 723.1.

GOULDS PUMPS, INC., Seneca Falls, N.Y.

MEN WANTED—POSITIONS OPEN

We can place—Managers, supts., foremen and mechanics for converting plants; mgr. degumming plant; supt. for asbestos cement shingles, flat sheets and corrugated board; supt. fourdrinier mach. paper mill; mgr. bag mfg. plant; day supts., night supts., and asst. supts. for board mills; purchasing agents and asst. purch. agents; paper mill technician to service and demonstrate sizing and other materials to pulp and paper mills.

Plant engineers, mech. engineers, master mechanics, maintenance and machine shop foremen, designers and draftsmen, salary range $5,000 to $10,000; chemists, chem. engineers and laboratory men; salesmen to sell paper, folding cartons, and to sell products to paper and pulp mills and paper converting plants; foreman cutting and creasing die room in folding carton operations; pulp and paper technologists; cylinder and fourdrinier mach. foreman; power supervisor; beater engineers; mach. tenders and back tenders.

List your confidential application with us to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St.—Boston 8, Mass.—Phone LIberty 2-6547
Specialists in placing and supplying paper mill executives

PLANT ENGINEER—To coordinate activities of design engineering firm and contractors during construction. Direct all engineering and maintenance in completed mill. Should have not less than ten years experience in pulp and paper mill maintenance. Experience in maintenace of sulphate pulp production facilities necessary. Familiarity with groundwood and newsprint production desirable. Summarize experience. Address: Bowaters Southern Paper Corp., Calhoun, McMinn County, Tenn.

INCREASE CANADIAN SALES

Canadian subsidiary of United States machinery builder, leader in its field, manufacturing machines used in paper mills and paper converting plants, seeks to represent in Canada machinery manufacturer interested in Canadian sales. Address: Box 545, The Paper Industry.

WANTED—CELLULOSE AND PAPER TECHNOLOGIST

With broad experience in the mechanical and chemical phases of the production of newsprint-grade pulp required by large research organization for one-year assignment in Far East. Outstanding opportunity for qualified person to investigate thoroughly raw materials, non-classical methods of paper production, and other cellulose and paper problems, and to develop cellulose and paper laboratory. Please send resume to Box 546, The Paper Industry.

THE FOURTH DICALITE PLANT

will add approximately 80% increased production capacity for DICALITE calcined and processed filteraids and fillers

The new plant of the Dicalite Division, Great Lakes Carbon Corporation, at Lompoc, Calif., is now in volume production at a continually increasing rate. It represents over 5 years of engineering, design and construction, and is the largest complete unit for processing diatomite built in the last 22 years. Full designed output will add approximately 80% increased production capacity for Dicalite calcined and processed filteraids, fillers and other materials.

This increased production capacity insures a plentiful supply of Dicalite products for the future. Users can be confident of dependable delivery; with four plants in operation chances of interrupted supply are greatly reduced.

Advanced design of the new plant has afforded greater operating flexibility and extended processing ranges. Specifications for performance and quality of each product are readily maintained. Research data are being accumulated to aid in developing new and improved Dicalite products for future industrial use.

DICALITE DIVISION GREAT LAKES CARBON CORPORATION

NEW YORK 17 • CHICAGO 1 • LOS ANGELES 17

save two ways with Silver Steel®

● You get better-quality, higher-income pulp with Atkins *Silver Steel* chipper knives—because the chips are always uniform and clean-cut.

You save by cutting cost, too—because *Silver Steel* knives deliver longer runs between sharpenings, grind faster and easier.

Consult your Atkins distributor now. Let him make the *Silver Steel* recommendations that save time and money on every cut. Standardize on *Silver Steel.*

CALL YOUR ATKINS DISTRIBUTOR

Fast, complete saw service is as near as your phone. Ask for *Silver Steel* hacksaw blades, saws, machine knives, files—for production, maintenance and other operations—for metals, woods and plastics.

BW ATKINS

ATKINS SAW DIVISION • BORG-WARNER CORPORATION
INDIANAPOLIS 9, INDIANA

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

Current quotations to mills, f.o.b. New York:

Blue Overalls	10.00 to 10.50
Washables, No. 1	4.75 to 5.00
Light prints, No. 1	8.00 to 8.50
Khaki Cuttings, Mixed	5.75 to 6.00
Canton Flannels, Bleached	14.50 to 15.00
Canton Flannels, Unbleached	14.50 to 15.00
White Shirt Cuttings, No. 1	14.50 to 15.00
Silesias, No. 1	11.50 to 12.00
New Unbleached Muslins	16.00 to 16.50
Fancy Shirt Cuttings	7.25 to 7.75
American Linen Cuttings	12.00 to 13.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.25 to 1.35
No. 2	.95 to 1.05
No. 3 and 4	.80 to .90
Twos and Blues—	
Repacked	2.75 to 3.00
Thirds and Blues—	
Repacked	2.25 to 2.50
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	5.75 to 6.25
Miscellaneous	5.00 to 5.25
White, No. 2—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelette	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.50 to 5.75
Domestic	5.75 to 6.00
Wool Tares—	
Light	6.25 to 6.50
Heavy	6.50 to 6.75
No. 1 Scrap Bagging	5.00 to 5.25
Manila Rope—	
No. 1 large	6.75 to 7.00
No. 1 small	5.75 to 6.00
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.50 to 7.00
Jute Threads—	
Foreign (Nom.)	7.00 to 7.50
Domestic	7.00 to 7.50
Strings—	
No. 1 sisal	5.75 to 6.00
No. 2 sisal	5.25 to 5.50
Soft jute	5.50 to 5.75
Mixed	3.25 to 3.50

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	115.00 to 120.00
Hard White No. 1	80.00 to 85.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	65.00 to 70.00
Soft White, Misc.	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	20.00 to 22.00
Mixed Books	14.00 to 15.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 40.00
Manilas—	
New Env. Cuttings	55.00 to 60.00
New Env. Cuts, One-Cut	—
Extra Manilas	22.50 to 25.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 30.00
News—	
White Blank	70.00 to 75.00
Overissue	23.00—
No. 1 Folded	14.00
Old Corrugated Containers	18.00—
New Jute Corrugated Cuts	23.00—
Mill Wrappers	10.00—
Box Board Chips	9.00—
No. 1 Mixed Paper	8.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	4.30—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	90.00—
Dry, barrels	95.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
30-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	21.00—
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tanks cars (wks) cwt.	2.70—
Gelatine (silicia), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	34.00 to 34.50
Litharge, powd. bbl. lb.	.15¾ to .16¾

MARKET QUOTATIONS

Rosin (Gum)— New York, per 100 lbs.

E	8.35—
F	8.35—
G	8.35—
WW	8.80—

Rosin (Wood), carlots,

F.O.B. South	4.35 to 4.50

Salt Cake—

Dom. bulk (wks) ton	17.00 to 23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	35.00—

Soda Ash—

Bulk (works) cwt.	1.20—
Paper bags, cwt.	1.50—

Soda (Caustic)—

Solid drums, cwt.	3.25 to 3.40
Ground and flake, drums, cwt.	3.75 to 3.85

Sodium Silicate—

60 deg. 55 gal. drums, (works) cwt.	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt.	1.30 to 1.40

Starch—

Pearl, 140 lb. bags, cwt.	6.44—
Pearl, barrels, cwt.	6.44—
Paper (Sp.) bags, cwt.	6.44—
Powdered, barrels, cwt.	6.65—

Sulphur (Crude)

(Mine) bulk, long ton	21.00 to 22.00

Talc—

Dom. 100 lb. bags (mine) ton	25.00 to 28.00
Canadian	35.00 to 45.00

Titanium Dioxide—

Barium Pig. bbls., lb.	.21 to .21½
Calcium Pig. bbls., lb.	.21 to .21½

Zinc Sulphide, bbls., lb. 11.50 to 11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite	140.00—
Unbleached sulphite	132.50—
Bleached sulphate	145.00—
Semi-bleached sulphate	140.00—
Unbleached sulphate	132.50—
Bleached soda	140.00—
Ground wood	92.50—
Sulphite screenings	72.50—
Sulphate screenings	67.50—
Ground wood screenings	60.00—
Unbleached sulphate siderurn	132.50—
Standard news print siderun	92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite	225.00—
Bleached sulphate	230.00—
Unbleached sulphite	200.00—
Unbleached sulphate	200.00—

Current quotations on imported wood pulp, dollars per short air dry ton, on dock American Atlantic ports with varying inland freight allowances follow:

Bleach. sulphite, Canadian	145.00—
Bleach. sulphite, Swedish	140.00—
Bleach. sulphite, Norwegian	140.00—
Bleach. sulphite, Finnish	140.00—
Unbl. sulphite, Canadian	135.00—
Unbl. sulphite, Swedish	115.00—
Unbl. sulphite, Finnish	130.00 to 135.00
Bich. kraft, Canadian	145.00 to 155.00
Bich. kraft, Swedish	142.50—
Unbl. kraft, Canadian	100.00 to 125.00
Unbl. kraft, Swedish	100.00—
Unbl. kraft, Finnish	105.00—

PAPER

Boards—

OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip	90.00—
News vat lined chip	92.50—
Filled news	90.00—
Solid news	92.50—
White vat lined chip	132.50—
Chip tube and can stock	100.00—
Single manila lined chip	137.50—
Single jute lined chip	135.00—
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

OPS ceiling prices (CPR 108) per cwt.:

Coated two sides

70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides	4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides	4 cases $13.65 Carloads $12.10

Uncoated

55 lb. No. 2 offset, 25x38-500, trimmed 4 sides	4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases $14.05 Carloads $13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads $12.40
16 lb. tablet, 17x22-500	Carloads $11.35

Rag Content Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—

OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—

OPS base ceilings (CPR 76):	per cwt.
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—

News—

	per ton
Rolls, Standard (Contract)	123.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—

	per ream
White No. 1	1.90—
White No. 2	1.40—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.80—
Manila	2.00—
Napkins, semi-crepe (12¼ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (13½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	10.00—
Toilet, Unbleached (M shts.) per cs.	8.00—

Towels

	per case
Bleached	6.20—
Unbleached	5.90—

Wrappings (Kraft)—

OPS ceilings, per cwt., 50 lb. base weight:

	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls	8.25—
Standard bag, mill rolls	7.50—
Shipping sack, mill rolls	7.75—
Gumming, mill rolls	8.00—
Asphalting, mill rolls	7.75—
Envelope, mill rolls	9.25—

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Rainy River water has color ranging from 40 to 80 ppm, making it unusable for bleached pulp and paper. The Minnesota & Ontario Paper Company successfully reduces color to a range from 2 to 4 ppm through use of two horizontal Permutit® Precipitators and five gravity filters. The cost for chemicals averages less than 1.5¢ per 1,000 gallons. The purity, low color and lack of turbidity make the effluent water ideal for production of high brightness pulps and papers.

Here is yet another case where Permutit know-how and equipment have helped produce finer pulps and papers, regardless of the original state of the water supply. For full information, write to The Permutit Company, Dept. PI-11, 330 West 42nd St., N. Y. 36, N. Y. or to Permutit Company of Canada, Ltd., 6975 Jeanne Mance St., Montreal.

PERMUTIT *CONTROLLED* PROCESS WATER MEANS:

- Clean, high quality paper products.
- Higher production—lower production costs.
- More sales . . . bigger profits.

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WATER CONDITIONING HEADQUARTERS FOR 40 YEARS

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—A POTENT SAFETY TOOL

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the 1951 Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

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425 N. Michigan Ave.
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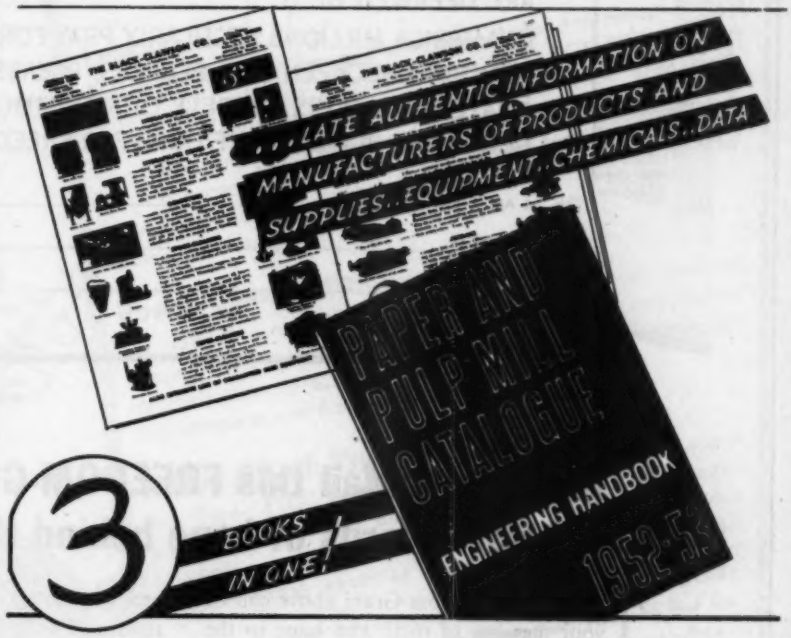

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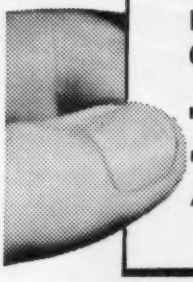

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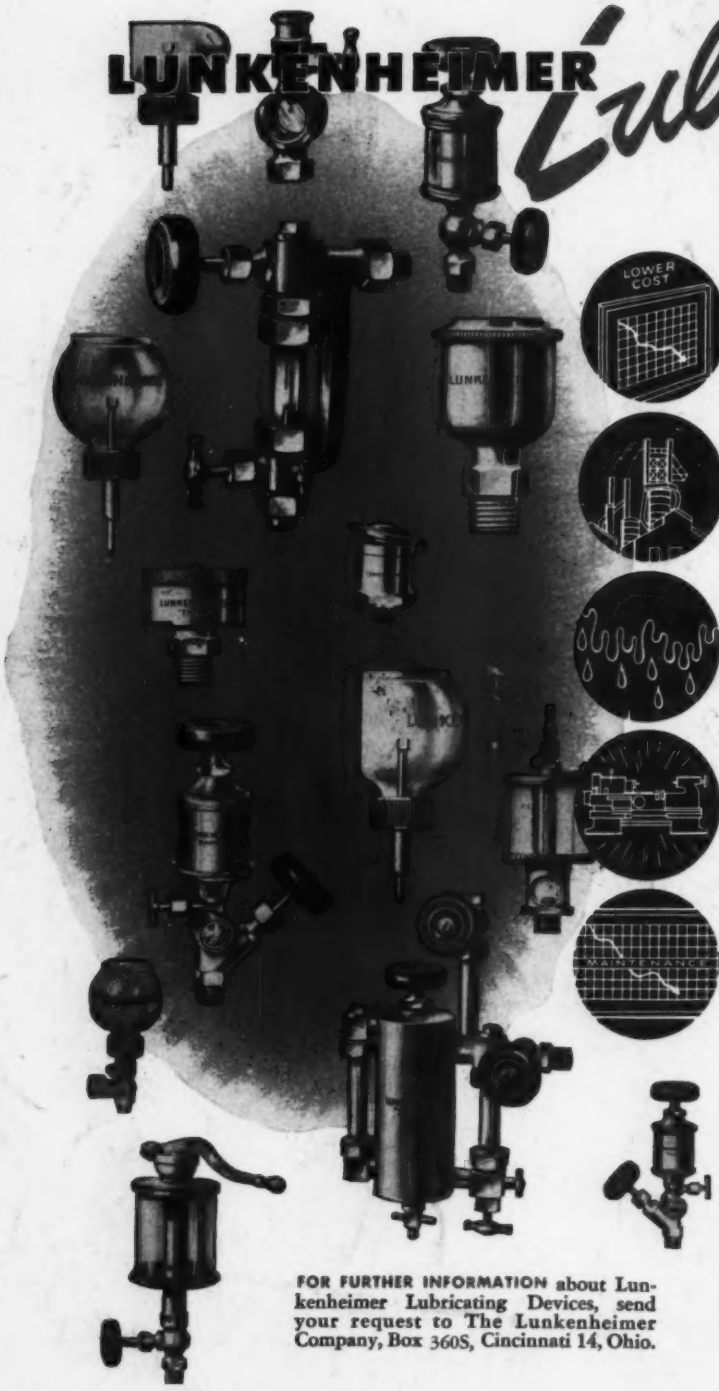

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